Noise in the Classroom Key Messages

Audiologists and speech-language pathologists are concerned with proper acoustics and background noise in the classroom which can interfere with a child's academic development.

- One in six words is not understood by the average Grade 1 student due to excessive background noise and poor acoustics in Canadian classrooms. (Bradley 2005)

- In order for speech to be understood, there must be an adequate speech-to-noise ratio meaning that the speech must be that much louder than the noise to be understood.

- Less than 10% of Canadian Grade 1 classrooms tested had an ideal Speech-to-Noise ratio. This means that 90% of our Grade 1 students are not hearing all of their teacher's words. (Bradley, 2005)

- Outside noise sources include vehicles, airplanes and voices in the playground. Inside sources of noise include equipment, such as computers, projectors, fish tanks, reverberation (the echo) of sound within the room due to hard surfaces such as uncarpeted floors, neighbouring classrooms, hallways, gyms, music rooms, ventilation and heating systems and classroom lighting systems, that emit a 'buzzing' noise.

- Young children, whose auditory centers are not fully developed in the brain, require better signal quality than adults to understand speech well. They do not have the language knowledge or life experience to "fill in the blanks" when they don't hear a word or only part of a word.

- Grade 1 children require a speech-to-noise ratio of 15.5 dB in order to achieve 95% speech intelligibility.

- Noise is measured by determining the sound levels in decibels. As a point of reference, average conversational speech is about 60 dB. The average unoccupied classroom background noise level measures around 50 dB. Add to that, the noise level of students in the class, around 10 dB, and you now have a noise level of 60 dB.

- It is critical to understand that when difficult listening conditions persist for some time, some children will "turn off" and stop trying to understand the words. Many of the children who are not hearing adequately become academically deficient in at least one subject by the 6th grade.

- **Adoption of the following recommendations is encouraged:** acoustic standards be included in the school building code, reduction of noise levels in the classroom by identifying and addressing noise sources where possible, addressing classroom noise and acoustics properly during the design, building and retrofitting of schools, designing classrooms with appropriate room size, ceiling height, sound separation between rooms, ventilation fans outside of the classroom, improved reverberation and sound absorption, improving sound separation between classrooms, hallways and outdoor areas and the application of the American National Standards Institute (ANSI) acoustic standards.

Tips to Improve Classroom Acoustics

- ❑ Place felt pads or other commercial products on the legs of chairs and tables in classrooms with no carpeting
- ❑ Add hypo-allergenic carpeting and curtains to classrooms
- ❑ Consider soundfield amplification systems
- ❑ Replace ballasts from noisy fluorescent lights
- ❑ Fix loose or vibrating parts on heating and ventilation systems
- ❑ Move free-standing furnishings to break up sound reflections and isolate areas in large rooms
- ❑ Use suspended acoustic ceiling tiles, sound-absorbent panels on upper walls
- ❑ Add cork boards to walls.

The ability to hear and understand the words of the teacher is an essential first step toward understanding the message!