

### NOISE AND CLASSROOM ACOUSTICS

Accompanying chart to lay paper on *Does the Classroom Assist or Impede the Learning Process?*

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<b>The Problem</b>	<p>If children are unable to hear and understand the words spoken by the teacher, they cannot learn the new concepts and ideas being taught.</p> <p>If only some of the words are understood, learning becomes more difficult depending on the child's own abilities to cope.</p> <p>Classrooms should fully support the learning process and not impede it.</p>
<b>Speech Recognition Tests</b>	<p>Speech recognition tests can measure children's ability to recognize clearly spoken, simple words in various classroom environments.</p> <p>From these tests we know that noise and any other clearly audible sounds will reduce children's ability to understand spoken words.</p> <p>They also show that less than ideal room acoustics can further degrade speech communication in rooms.</p>
<b>Noise</b>	<p>For accurate speech communication, the speech sounds must be noticeably louder than noises and other interfering sounds.</p> <p>The recommended ideal for noise to not exceed 35 dBA in a classroom is very quiet and indicates that most clearly audible sounds interfere with speech communication.</p>
<b>Sources of Noise</b>	<p>Heating and ventilation system noises. <i>Solution: use quieter ducted central ventilation systems and avoid units located in the classroom.</i></p> <p>Student activity noise from adjacent spaces or from outdoors. <i>Solution: Move or reschedule the activity causing the noise; improve the sound insulation of walls and windows.</i></p> <p>Other outdoor noises. <i>Solution: Better sound insulation of exterior walls and windows, and locate new construction away from noisy roads and other noise sources.</i></p> <p>Student activity noise in the classroom. <i>Solution: When a critical teaching activity is in progress, the teacher must ensure that students are quiet and attentive.</i></p>
<b>Room Acoustics</b>	<p>Some reflecting surfaces are essential to enhance speech sounds at positions far from the talker and also when the talker turns his/her head away from a listener.</p> <p>If a room is too large (&gt;250 m<sup>3</sup>) speech sounds may reverberate around for more than a second and degrade intelligibility as occurs in many gymnasias. <i>Solution: Classrooms should not be too large and should include some sound absorbing surfaces.</i></p>
<b>More Problems</b>	<p>The concept of open plan schools is inconsistent with any rational attempt to have accurate speech communication. It is not possible to meet the ideal goal of no more than 35 dBA of noise in an open plan classroom. Since the interfering sounds are often speech from adjacent teaching spaces, they are likely to be more disruptive than most types of noise.</p> <p>While noise interferes with a listener's ability to understand speech, it also causes talkers to raise their voices. The fact that many teachers talk with raised voice levels for long periods of time contributes to their frequently experienced voice problems.</p>