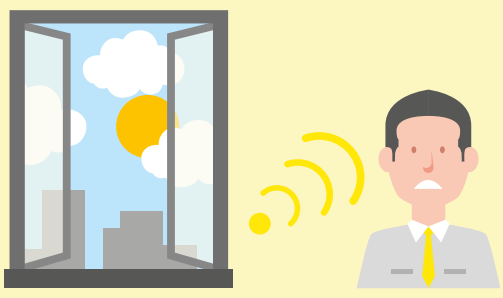
THE BENEFITS OF A SOUND EDUCATION

Acoustics is a topic we're all familiar with when discussing concert venues, offices and studios, but what about the acoustics of our classrooms? Every day millions of children go to school to receive their education, and every day that education is being hampered by the stumbling block of poor classroom acoustics. If a child is unable to clearly hear a teacher, then how is that child meant to learn? If a teacher has to shout, what harm will that do to the relationships they build with their students? What is the full extent of this problem?

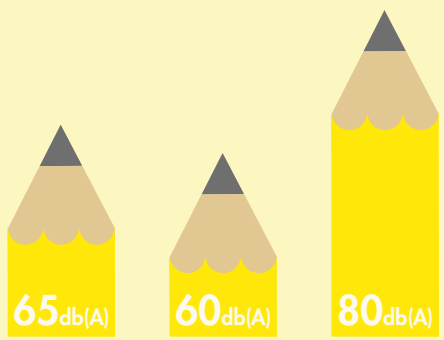
Teacher Troubles...



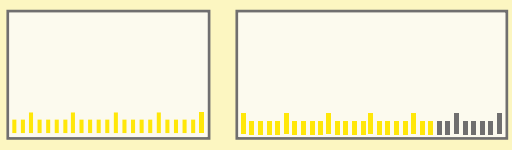
85% of teachers in one study claimed that external noise causes problems

80% of teachers complain that the noise made by students is a problem

Teachers are **32x** more likely to have voice problems than others in similar professions



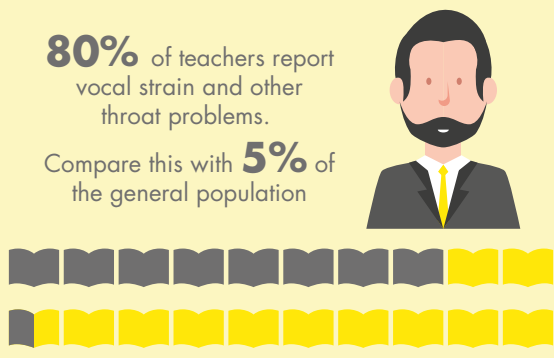
The average occupied classroom has a sound pressure of **65dB(A)**. This can go higher e.g. traffic, projectors or mechanical ventilation. Normal conversation is around **60dB(A)**.

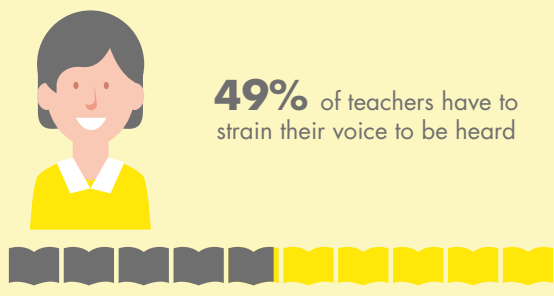


Given that the signal to noise ratio ideally needs to be **+15dB(A)**, especially for young hearers and SEN students, teachers are having to speak beyond comfortable levels, up to **80dB(A)**.

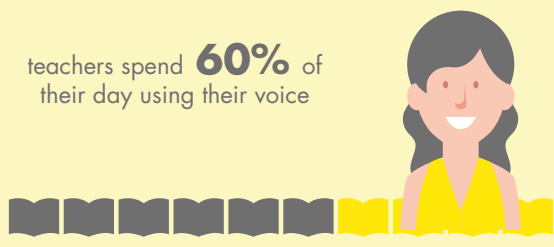
80% of teachers report vocal strain and other throat problems.

Compare this with **5%** of the general population



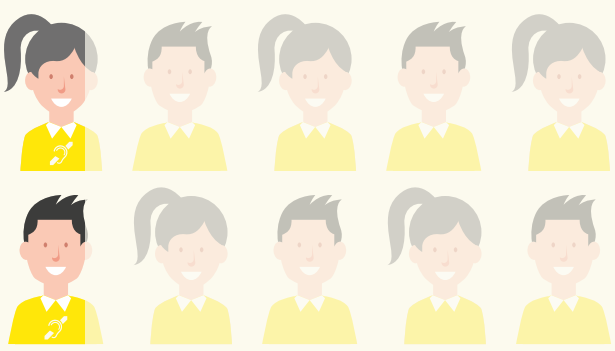


49% of teachers have to strain their voice to be heard



teachers spend **60%** of their day using their voice

Pupil Problems...

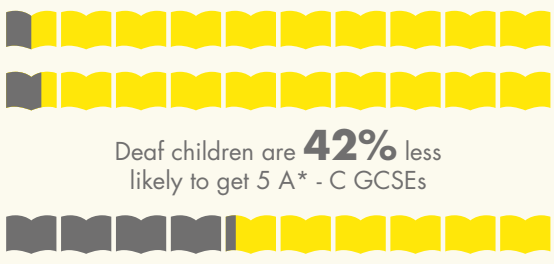


16-18% of the school population have some sort of hearing difficulty

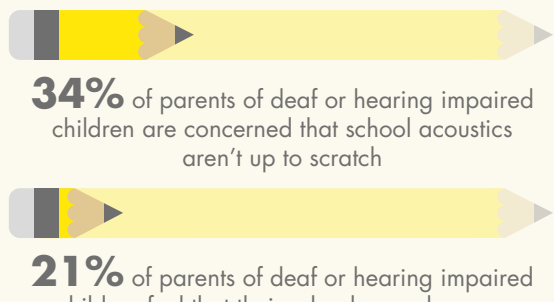
10db increase in noise causes an average

5% drop in SATs scores at Key Stage 1

7% at Key Stage 2



Deaf children are **42%** less likely to get 5 A* - C GCSEs



34% of parents of deaf or hearing impaired children are concerned that school acoustics aren't up to scratch

21% of parents of deaf or hearing impaired children feel that their school or early years setting did not have appropriate expectations of what their child could achieve

80% of deaf children are taught in mainstream schools

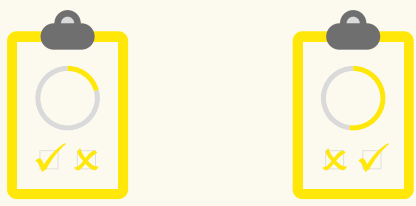
at **7 metres away** from a teacher, **only 36%** of what is said is being understood

A **5db increase** in aeroplane noise causes a 2 month delay in reading ability

A year's tuition at a specialist school £90k

Sound treatment in a classroom £2.5k

Fitting sound treatment in a classroom cost - £2,500 for the life of the classroom. Sending a hearing impaired child to a specialist school - **£90,000 a year**



Only 21% of UK local authorities can confirm that school acoustics in their area meet government standards

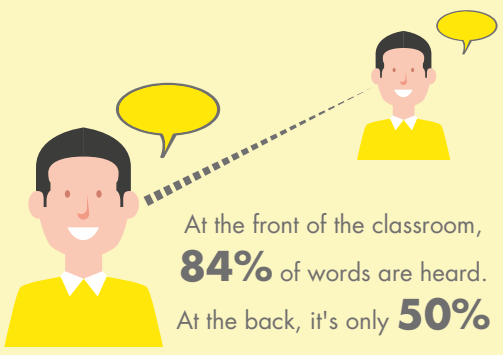
52% of local authorities confirmed that schools in their area had failed to meet acoustic standards

<35dB

Building Bulletin 93 (Bldg Regs E4) **states:** Teaching spaces intended specifically for students with special hearing and communication needs (including autism), should not exceed **35dB** as a measured average over 30 mins. The reverberation time should not exceed **0.4 secs** over a wide range of frequencies (125Hz-4000Hz)

Many schools around the UK have classrooms with a reverberation time as high as **1.2 seconds**.

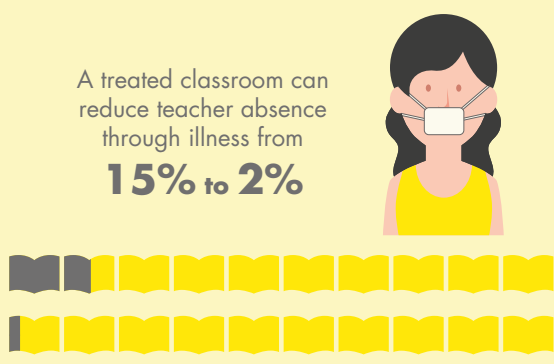
Acoustics...



At the front of the classroom, **84%** of words are heard. At the back, it's only **50%**

In a 1990 study, students in an acoustically treated classroom asked for less repetitions, and on-task behaviour **increased 17%**

A treated classroom can reduce teacher absence through illness from **15% to 2%**



Regulations...

The BB93 standard sets classroom reverberation times for both new-build and refurbishment for a **primary school classroom**:

<0.6 Tmf seconds for **NEW BUILD**

<0.8 Tmf seconds for **REFURBISHMENT PROJECTS**

In a **secondary school classroom**, the standard is

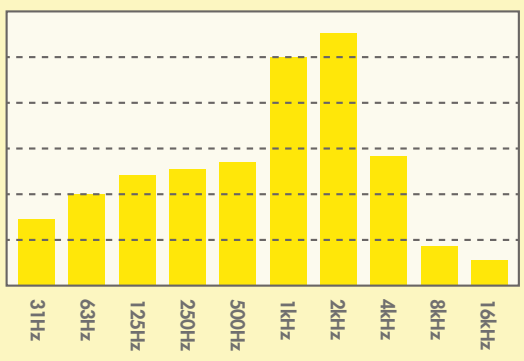
<0.8 Tmf seconds for **NEW BUILD**

<1.0 Tmf seconds for **REFURBISHMENT PROJECTS**

The new criteria for spaces where children with **special educational needs (SEN) rooms** are taught is:

<0.4 Tmf seconds averaged from **125Hz** to **4kHz** octave bands

<0.6 Tmf seconds in every octave band in this range



Each room or other space in a school building shall be designed and constructed in such a way that it has the acoustic conditions and the insulation against disturbance by noise appropriate to its intended use.

Pupils with special needs may need to be taught in spaces with lower noise levels and shorter reverberation times than in mainstream classrooms.

For additional resources and content or to join the debate on Twitter, use the hashtag **#AcousticMatters**

SOURCES

American-Speech-Language-Hearing Association (ASHA) | Guidelines for Addressing Acoustics in Educational Setting, ASHA | Classroom Acoustics, ASHA - Acoustics in Educational Settings: Position Statement Ecophon, The Essex Study | The Institute for Enhanced Classroom Hearing | Proven Benefits of Sound Enhancement Systems, Julian Treasure's talk at Sound Education The National Deaf Children's Society (NDCS) Must Do Better report | British Association of Teachers of the Deaf survey 2000 | Classroom Acoustics - A New Zealand Persp (LSHSS) Classroom Acoustics for Children With Normal Hearing and With Hearing Impairment | Ecophon - Modern Acoustics. Building Regulations and Approved Document E DfE Advice on Standards for School Premises, 2015

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