Indoor Air Quality

How are students affected by the air they breathe?

41% of public school districts need to update or replace heating, ventilation, and air conditioning (HVAC) systems in at least half of their schools.

Improving indoor air quality with reduced CO2 in the classroom improves student performance:

- 12% faster task completion
- 2% reduction in errors
- 2.5% improvement in daily attendance

If improving air quality could reduce the number of sick days by even 10%, it would save the average school district $675,000 a year.

That's more money that could be going towards students’ learning and teacher salaries.
Thermal Comfort
How cold or warm do kids feel in class?

Temperature matters—even more on schoolwork than office work, studies show.

Ideal classroom temperature

- **68° - 75°**
  - Winter
- **73° - 79°**
  - Summer

20%

Adjusting classroom temperatures to improve thermal comfort can boost student performance on psychological tests and school tasks by 20%.
Lighting
Is the lighting helping or hurting student tasks?

28% of public school districts need to update or replace interior light fixtures in at least half of their schools.

The lighting in school can affect:

Sleep
The amount and type of light impacts a child’s circadian rhythm—the natural internal process that regulates the sleep/wake cycle.

Productivity
Adjusting the intensity and color temperature of lighting can optimize student activities like test-taking and reading.

Mood
Lighting’s effect on circadian rhythm not only matters to how well a child sleeps, but also how they feel.

The Right Light
Dynamic lighting—varying lighting techniques based on student activity—can support classroom learning. LED technology allows for variation in lighting intensity and color temperature that can help augment the environment for students.

3,500k neutral white light
5,000k cool white
6,600k cool, bluish light

Students felt more alert and scored higher on their tests when they were in a classroom with 6,600K lighting, which mimics daylight, when compared with other kinds of lighting.
Is noise disrupting students’ tasks?

Children are much more affected by noise than adults, and chronic exposure to outside or distracting noises may affect a child’s cognitive development and learning.

Improving acoustics improves performance.

There is a direct relationship between acoustic comfort and student productivity. Generally, the less noise, the better.

Examples of ambient noise at school

Outside
- Lawn mowers
- School buses
- Children playing

Inside
- Students talking
- Lockers slamming
- Noisy fluorescent lights
- Air conditioning units

Noise levels affect students’

- Intentional and incidental recall
- Speech
- Listening comprehension
- Reading
- Writing
- Test performance
- Grade point average

Sources: American Speech-Language-Hearing Association; Institute of Educational Sciences; ScienceDirect; Trane; UL; U.S. Environmental Protection Agency; U.S. Government Accountability Office