

Q&A

Top Questions and Answers

Air Quality and Ventilation
Issues for School Boards and Parents



The quality of the air in our schools has a profound effect on the health and success of our students, teachers and staff. Today, there are many questions on the minds of the administrators and parents about ventilation and contaminants that may be answered here. For more insights, visit our website: modinehvac.com

Q: What affects air quality in school buildings?

A: Indoor air quality (IAQ) in schools is affected by many indoor air pollutants, among them particulates (dust), debris, fibers, mists, gases, emissions, cleaners, CO₂, and other odors. Other factors that affect IAQ are heating, air conditioning and ventilation equipment design and operation, including unit/room ventilators and central air-handling systems; building design, occupation fluctuations, and traffic flows; air and pollution pathways, including natural ventilation (open windows and doors) and mechanical ventilation.^{1,2}

Q: Do students face particular air quality risks?

A: Children may be more susceptible to air pollutants and more vulnerable to environmental hazards because their bodies are still developing. Typical schools have approximately four times as many occupants as an office building with the same amount of floor space, according to OSHA. EPA studies show indoor air pollution levels may be two-to-five times – and occasionally more than 100 times – higher than outdoor levels, and that most school ventilation rates are below recommended levels.^{2,3,4,10}

Q: How does air quality in school buildings affect student and teacher performance?

A: Good IAQ, through adequate ventilation in schools and classrooms, has been shown to reduce absences and transmission of infectious diseases; improve overall student, teacher and staff health and productivity; and improve student test scores, concentration, recall and overall attention rates. In one study, students in classrooms with higher outdoor air ventilation rates scored 14-to-15% higher on standardized tests than students in classrooms with lower rates. In contrast, poor IAQ, caused by inadequate ventilation and cleaning, triggers respiratory health problems, increased absenteeism, and a downturn in performance and achievement.^{1,5}

Q: How do we know if the students/teachers/administrators are breathing safe, clean air in our school?

A: School district administrators should regularly share current information on indoor air quality, including CO₂ levels, and local and national air quality code compliance data. In addition, school leaders should be aware of and use new and ongoing expert IAQ recommendations, especially those relative to preventing COVID-19's spread in schools. Guidance and suggested standards are available from several sources, including the National Air Filtration Association, the U.S. Environmental Protection Agency, the American Society of Heating, Refrigerating and Air-Conditioning Engineers and the U.S. Centers for Disease Control and Prevention. School leaders can share their progress and performance based on expert advice.^{4,6}

Q: Have recommendations for school air quality and ventilation equipment changed because of the pandemic?

A: Yes, there are several new and regularly updated recommendations from federal, state and local government agencies and from professional and industry association experts. The guidance includes increased HVAC inspection and maintenance measures; evaluating HVAC system improvements, additions, and/or upgrades; system filter upgrades; and site/facility actions, such as multiple daily air system purges in schools. School and district administrators should be aware of and use tools and advisories from the CDC, EPA, ASHRAE, and other sources.^{6,7,8,9}

Q: After schools shut down and re-open, what key steps should institutional leaders take to assure good air quality throughout the facilities?

A: School administrators and facility management are advised to:

- Assess HVAC system condition and test operations, including all external and inside building components and air access points
- Evaluate the need for repairs, updates or upgrades
- Adjust HVAC settings to maximize airflow
- Deploy spot air quality checks
- Implement a twice-daily air purge routine for the entire facility, before and after classes and activities
- Upgrade system filters to MERV 13 rated or above
- Consider supplemental technologies, such as HEPA fan/filtration systems or ultraviolet germicidal irradiation^{2,13}

Q: How can we determine whether our school needs a new/updated HVAC system?

A: Based on EPA, the Government Accountability Office, and other agency research and data, more than half of U.S. schools have heating and ventilation equipment and systems issues that can lead to unsafe air – 36,000 schools need HVAC updates. School administrators and parent groups should understand their school's current IAQ performance data against norms and standards, including those available from ASHRAE. A third-party expert assessment of current HVAC equipment and its operation, as well as a school building design, ventilation and IAQ needs assessment, can be commissioned. Data can and should drive the decision-making.^{11,12}

Q: Once we determine we need a new/updated HVAC system what are the key next steps?

A: Many factors need to be weighed and put into a project plan and business case. Involving key stakeholders and informing the school community before and throughout the process is key. School facility and maintenance management often are advised to use a third-party contractor for project and supply management. External experts can have a broad and deep knowledge of solutions, including current and future technologies. Cost/benefit analyses involve not only technical but financial expertise. A replacement or even a partial system upgrade should be planned over several months, or longer, given equipment and funding factors.^{1,2,13}

Q: Has the federal government allocated monies for HVAC updates and supplies related to improving school air quality within COVID-19 relief and stimulus packages, and if so how much?

A: Analyses and reports continue to be released about the amount and types of funding available to schools for HVAC and safety improvements. Current estimates suggest more than \$200B is to be available nationwide, based on stimulus actions already signed into law. Additional funding may be available at the state and local levels.^{14,15}

Sources

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2 American Society of Heating, Refrigerating and Air-Conditioning Engineers. "Reopening of Schools and Universities."

3 Learning Policy Institute. "The Air We Breathe: Why Good HVAC Systems Are an Essential Resource for Our Students and School Staff."

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5 U.S. Centers for Disease Control and Prevention. "Ventilation in Schools and Childcare Programs."

6 "U.S. Environmental Protection Agency." Reference Guide for Indoor Air Quality in Schools

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8 U.S. Environmental Protection Agency. "What is MERV Rating?"

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10 U.S. Department of Labor Occupational Safety and Health Administration. "Indoor Air Quality Schools."

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12 American Lung Association. "Clean Air at School."

13 U.S. Department of Education. ED COVID-19 Handbook Strategies for Safely Reopening Elementary and Secondary Schools.

14 Air Conditioning Heating Refrigeration The News. "HVAC Upgrade Dollars Flow to School Districts."

15 Hospital School University Campus Safety. "Funding for Healthy Buildings and Indoor Air Quality Upgrades."