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## General Description:

Improving school Indoor Air Quality (IAQ) has been shown to decrease respiratory-related illness infection rates and positively impact student attendance. This includes reducing rates of COVID-19 but extends to reducing the spread of other respiratory illnesses (common cold, flu, etc.) and reducing the severity of asthma symptoms.

*Research findings are clear that indoor air quality improvements improve respiratory health-related outcomes:*

- In Connecticut, adopting a program based on the *IAQ Tools for Schools* has helped address IAQ problems in more than 850 schools (Connecticut Education Association, 2011):
  - In Hamden (CT), absenteeism rates fell by more than 50%
  - In the North Haven (CT) school district, school nurse visits were reduced by 11% and reported respiratory cases declined by 48%
  - In Hartford (CT), the school district saw a 21.2% decrease in asthma cases within a single year
- After implementing an indoor air quality management program, the Omaha Public School District observed a decrease in asthma attacks' frequency and severity.
- Lower ventilation rates have been linked to more missed school days caused by respiratory infections; greater prevalence and incidence of symptoms of sick building syndrome; greater mean number of school nurse visits caused by respiratory symptoms; increased asthmatic symptoms and risk for viral infections; and the transmission of airborne infectious diseases such as chickenpox, measles, and influenza.

*Improved air quality is also linked to improved student outcomes:*

- Students' attention processes are significantly slower in classrooms with high CO<sub>2</sub> levels and low ventilation rates. Researchers observed a 5% decrease in "power of attention" in poorly ventilated classrooms, roughly equivalent to the impact that a student might feel from skipping breakfast.
- With similarly poor CO<sub>2</sub> levels and ventilation rates in school buildings, students have been observed to experience greater fatigue, impaired attention span, and loss of concentration; poorer performance on tests of concentration; and lower levels of focus among university students during lectures.
- A study of fifth-grade students in 54 U.S. classrooms reported evidence of an association between ventilation rates and pupils' performance on standardized mathematics tests.

*Not all ventilation systems are created equal:*

- By definition, HEPA filters are at least 99.97% efficient at filtering COVID virus particles. Look for "certified HEPA" filters. Other terms like, "HEPA plus" are not certified and do not guarantee the same degree of filtration efficiency.
- It is important to match the size of the system to the space. Depending on the size of the HEPA units and the facility configuration, and how the facility in which they are being used is configured, multiple small portable HEPA units may work more effectively than one large unit.
- While the benefits are clear, and improvements in ventilation can be accomplished in a variety of ways, they often require capital-intensive remodeling work that can take time to prepare and execute.
- The CDC has provided guidance on ventilation that includes additional considerations, updated as of June 2021. <https://www.cdc.gov/coronavirus/2019-ncov/community/ventilation.html#refphf>



## Frequently Asked Questions:

1. **Can COVID-19 be transmitted through HVAC (ventilation) systems?** According to [the Centers for Disease Control and Prevention](#), aerosolized COVID-19 particles can remain suspended in the air for long periods, including after an infected person leaves a room. Research shows that upgrading air filtration systems and increasing outdoor airflow into indoor spaces can help prevent the transmission of COVID-19 and other airborne diseases.
2. **Where can I find out more information on ventilation systems and their impact on schools?** For more information on anti-virus air filtration systems' impact on school environments and other relevant research, read the following publications:
  - [\*The Foundations for Student Success: How School Buildings Influence Student Health, Thinking and Performance\*](#)
  - [\*Healthy Buildings: How Indoor Spaces Drive Performance and Productivity\*](#)
  - [\*Mitigating Airborne Disease Transmission for K-12 and Higher Education Best Practice Recommendations for Breathing Air\*](#)