

BREAK FROM CLASSROOM TRADITION

Displacement ventilation delivers superior air quality for students

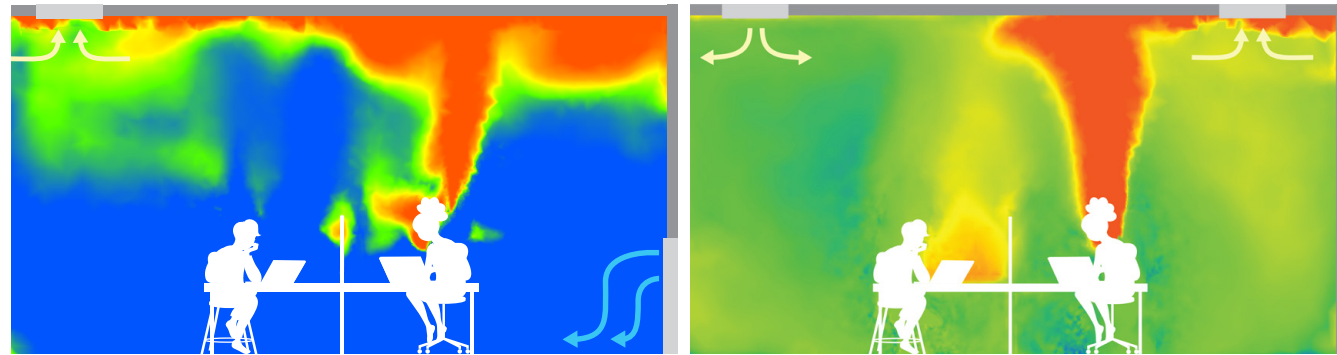
Reading the room

Many studies and research articles quantify significant improvements in air quality and student health with displacement ventilation:

- + **Removes particles efficiently**, displaced upwards out of breathing zone¹¹
- + **Reduced asthmatic symptoms** by 69%¹
- + **Ventilation effectiveness** improvement up to 46%²
- + Twice as effective at **delivering fresh air** to the breathing zone when compared to traditional mixing systems³
- + ~30% **lower peak CO₂ levels**^{4,5} that can lead to improved student performance.

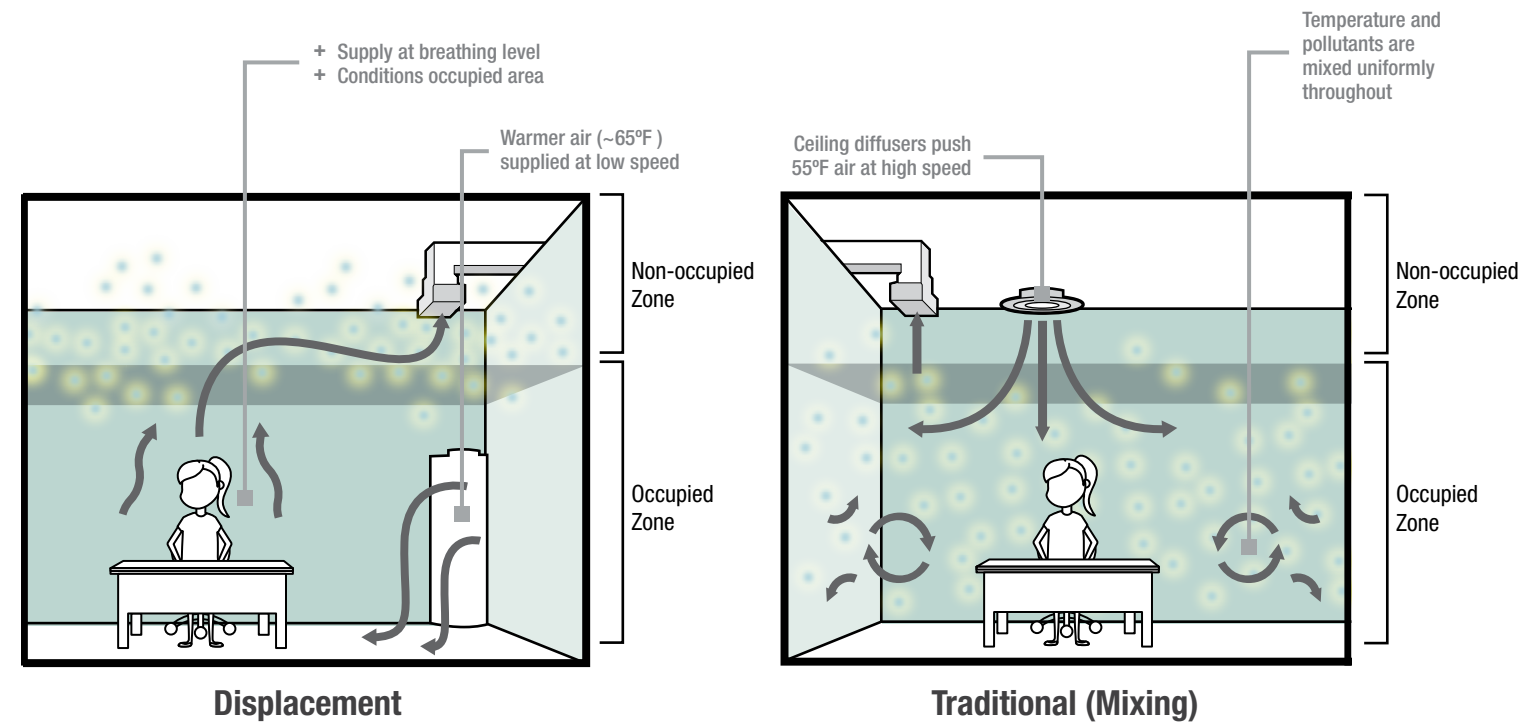
How does displacement work?

Displacement Ventilation supplies air directly into the occupied portion of the space at low air speeds. The air rises as it comes in contact with occupants and carries particles and pollutants up into the non-occupied zone, where it is removed and filtered. It does all of this while being one of the most energy efficient and quiet methods of air ventilation on the market.



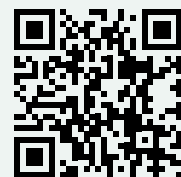
Displacement

Traditional (Mixing)



Displacement

Traditional (Mixing)



Visit our [website](#) to dive deeper into the benefits of displacement ventilation systems in education.



Watch our [Introduction to Displacement Ventilation](#) video from our Training Series



Displacement ventilation systems have led to higher overall school indoor air quality and **lower CO₂ levels**. Many schools report **reduced absenteeism**, some as high as 25%.

Massachusetts Design Engineer Principal



PROMOTING STUDENT WELLNESS

Benefits of displacement ventilation

Superior thermal comfort

Air is supplied at a lower velocity and temperature closer to the room temperature for occupant comfort.

Lower noise levels

No fans or moving parts help keep the classroom background noise level < 35dBA (Very Quiet – Library).

Ease of maintenance

No moving parts and mechanical equipment to be serviced or maintained.

Comparable first cost

Displacement ventilation is similar in first cost compared to other conventional systems.

Reduced life cycle costs

Schools realized up to 66% in energy savings compared to traditional HVAC systems.



Watch our [Displacement in Schools](#) case study video



Architects will thank you! Can you spot where displacement ventilation is used in each of these pictures?

(Hint: Look for the Price logo)

Various well regarded institutions recommend using displacement ventilation.^{6,7,8,9}

References

- 1 Smedje, G., & Norback, D. (2000). New Ventilation Systems at Select Schools in Sweden - Effects on Asthma and Exposure.
- 2 ASHRAE. (2019). ANSI/ASHRAE Standard 62.1-2019: Ventilation for Acceptable Indoor Air Quality. ASHRAE.
- 3 Jung, A., and M. Zeller, 2005. Analysis and Testing of Methods to Determine Indoor Air Quality and Air Change Effectiveness. Original technical paper from Rheinisch-Westfälische Technical University of Aachen, Germany, 1994
- 4 Arent, J., Eley, C., & Meister, B. (2006). Displacement Ventilation in Action: Performance Monitoring of Demonstration Classrooms. ACEE Summer Study on Energy Efficiency in Buildings.
- 5 Allen, J. G., & al., e. (2015). Associations of Cognitive Function Scores with CO2, Ventilation and VOC Exposures in Office Workers; A Controlled Exposure Study of Green and Conventional Office Environments. Environmental Health Perspectives 124.6.
- 6 United States Environmental Protection Agency. (2018, December 21). Designing and Constructing High Performance Schools for a Healthy School Environment. Retrieved from United States Environmental Protection Agency: <https://www.epa.gov/schools-healthy-buildings/designing-and-constructing-high-performance-schools-healthy-school>
- 7 International Well Building Institute. (n.d.). Retrieved from International Well Building Institute: <https://www.wellcertified.com/en>
- 8 Collaborative for High Performance Schools. (n.d.). Retrieved from Collaborative for High Performance Schools: <https://chps.net/>
- 9 U.S. Green Building Council. (n.d.). Retrieved from U.S. Green Building Council: <https://www.usgbc.org/>
- 10 United States Environmental Protection Agency. (2019, March 11). *Creating Healthy Indoor Air Quality in Schools*. Retrieved from United States Environmental Protection Agency: <https://www.epa.gov/iaq-schools>
- 11 ASHRAE Journal. (2022, December 1). Reducing Airborne Particulates Using Displacement Ventilation