National Institute for Occupational Safety and Health (NIOSH)
Ventilation

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Ventilation in Schools and Childcare Programs

AT A GLANCE

- Small particles that people breathe out can contain virus particles, including the viruses that causes COVID-19 and influenza (flu).
- Good ventilation, along with other preventive actions, can help prevent virus transmission in schools.
- The risk of getting sick varies according to individual susceptibility and the number of virus particles to which a person is exposed. The *fewer* virus particles in the air, the better.

Why it's important

Ventilation is one component of maintaining healthy environments and is an important illness prevention strategy for schools and childcare programs. Good ventilation is a step that can reduce the number of virus particles in the air. Along with other preventive actions, ventilation can reduce the likelihood of spreading disease.

Learn how to improve ventilation below.

Below are ways you can improve ventilation in your school or childcare program, whether in a large building or in a home.

Bring in outdoor air

Bring as much outdoor air as possible.

If safe to do so, open windows and doors. Even just cracking open a window or door helps increase outdoor airflow, which helps reduce the potential concentration of virus particles in the air. If it gets too cold or hot, adjust the thermostat. Do not open windows or doors if doing so poses a safety or health risk (such as falling, exposure to extreme temperatures, or triggering asthma symptoms).

Use child-safe fans to increase the effectiveness of open windows. Safely secure fans in a window to blow potentially contaminated air out and pull new air in through other open windows and doors.

Consider having activities, classes, or lunches outdoors when circumstances allow.

Check HVAC settings

Make sure Heating, Ventilation, and Air Conditioning (HVAC) settings are maximizing ventilation.

Ensure HVAC systems are **serviced and meeting code requirements**. They should provide acceptable indoor air quality, as defined by ASHRAE Standard 62.1, for the current occupancy level for each space.* Home-based childcare programs should meet requirements established by their state and local regulatory authorities.

Set HVAC systems to bring in as much outdoor air as your system will safely allow. Reduce or eliminate HVAC air recirculation, when practical and with expert HVAC consultation.*

Increase the HVAC system's total airflow supply to occupied spaces when you can. More air flow encourages air mixing and ensures any recirculated air passes through the filter more frequently.

Disable demand-controlled ventilation (DCV) controls that reduce air supply based on occupancy or temperature. This way the air supply will remain constant throughout the day.

For simple HVAC systems controlled by a thermostat, setting the fan control switch from "Auto" to "On" will ensure the HVAC system provides continuous air filtration and distribution.

Consider running the HVAC system at maximum outside airflow for 2 hours before and after the building is occupied to refresh air before arrival and remove remaining particles at the end of the day.

Filter and clean the air

Filter and clean the air in the school or childcare building

- **Improve the level of air filtration as much as possible** without significantly reducing airflow.
- **Make sure the filters are sized, installed, and replaced according to manufacturer's instructions.**
- **Consider portable air cleaners that use high-efficiency particulate air (HEPA) filters** to enhance air cleaning wherever possible, especially in higher-risk areas such as a nurse's office or sick/isolation room.
- **Consider using germicidal ultraviolet (GUV)** in schools and non-home-based childcare programs as a supplemental treatment to inactivate the virus that causes COVID-19, especially if options for increasing ventilation and filtration are limited. Consult a qualified professional to help design and install any GUV system.

Use exhaust fans

Use exhaust fans in restrooms and kitchens

- **Inspect and maintain exhaust ventilation systems** in restrooms and kitchens.
- **Ensure restroom and kitchen exhaust fans** are on and operating at full capacity while the school or childcare program is occupied and for 2 hours afterward.

Open windows in buses

Ventilation is important on buses and vans servicing schools and childcare programs, along with other strategies such as mask use for people over 2 years old and physical distancing.

Keep vehicle windows open when it does not create a safety or health hazard. Having more windows open is more helpful, but even just cracking a few windows open is better than keeping all windows closed.

Resources and tools

- U.S. Environmental Protection Agency:
  - Indoor Air Quality Tools for Schools
  - Creating Healthy Indoor Air Quality in Schools
  - Clean Air in Buildings Challenge: Guidance to Help Building Owners and Operators Improve Indoor Air Quality and Protect Public Health
- U.S. Department of Education:
  - Strategies for Safely Reopening Elementary and Secondary Schools PDF
- Harvard University:
  - 5 Step Guide to Checking Ventilation Rates in Classrooms
- National Resource Center for Health and Safety in Childcare and Early Education:
  - Caring For Our Children Chapter 5.2.1: Ventilation, Heating, Cooling, and Hot Water

SOURCES

CONTENT SOURCE:
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