



Healthy Buildings:

Guide to schools during COVID-19



KEY POINTS

- Healthy buildings include foundational measures and basic mitigation strategies such as:
 - Handwashing
 - Use of PPE
 - Social distancing
- Cleaning and disinfecting combined with universal precautions help to reduce the risk and spread of COVID-19 and promote healthy buildings.
- Testing alerts, sick people stay home, and vaccine mitigation strategies prevent or reduce severe illness – these are vital in the effort to control the pandemic and protect individuals in indoor spaces.

This guide provides information on building and maintaining healthy schools during the pandemic. It is intended for school administrators, facility managers, custodial staff, supply purchasers, teachers, school nurses and others involved in building and environmental management. The objectives are to:

- Inform on transmission and spreading of the air borne and respiratory particles such as Sars-CoV-2
- Describe best practices for healthy buildings
- Provide resources to promote healthy schools

Virus Transmission

SARS-Cov-2 virus is small in size, approximately 0.12 micron (μm) and can be spread via droplets and aerosols.¹ Depending on how droplets enter the air, (e.g., breathing, talking, singing, coughing, or sneezing), these particles can spread 6 feet or further² and remain in the air for a period of time, and then settle on surfaces.^{3, 4, 5} Implementing healthy building practices are paramount to reducing the spread of the coronavirus during this pandemic and reducing the health risk for many others.

Healthy Buildings

Several elements and foundational measures have been cited for healthy buildings including:^{6, 7, 8, 9, 10}

- Handwashing – with soap and water preferable.
- Personal Protective Equipment (PPE) - mask should be worn when entering the building, in common areas, and when taking the elevators. Wearing a mask protects the wearer and others.
- Social distancing – 3 feet (students) to 6 feet (adults) apart, staggering schedules, establishing groups or pods, and physical barriers sufficient to reduce spread and not reduce air flow.
- Cleaning and Disinfection - protocol that defines the locations, timing, and frequency of cleaning and training of staff on products and procedures.



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- Heating, Ventilation and Air Conditioning (HVAC) systems – fresh air ventilation, temperature, and humidity (dew point) control.
- Technology - portable air purifiers and new technologies like touchless entryways, elevators, and lavatories.
- Minimize Exposure – greater virtual time instead of in-seat time and limit general exposure (e.g., Implement one-way entry, hallways, and exits).
- Structural and environmental controls – run exhaust fans continuously, reduce dust and pests, moisture control, reduce intake of outdoor pollutants, safety, security, water quality, noise and good lighting.

Components of a healthy school model to reduce virus transmission and promote healthy buildings

Healthy Schools Implementing Building Best Practices

◆ Quality Improvement

- ❖ Results
- ❖ Lessons learned
- ❖ Success stories

◆ Nutrition

- ❖ Meals & snacks
- ❖ Drinking water

◆ Physical & Mental Health

- ❖ Precautions for greater risk areas (nurses office, choir or band rooms, gyms)
- ❖ Symptom reporting
- ❖ Testing and contact tracing
- ❖ Vaccinations

◆ Prepare

- ❖ Plan for opening, maintaining, and monitoring systems
- ❖ Assessments, upgrades, and reviews of buildings, systems, community data, & protocols
- ❖ Communication with parents and children



◆ Ventilation

- ❖ Mechanical: HVAC systems
- ❖ Natural (non-mechanical): Windows and airflow
- ❖ Moisture control activities

◆ Protect each other

- ❖ Hygiene – handwashing, restrooms, and portable stations
- ❖ Masks UP– entering and indoor spaces
- ❖ Distance – students at least 3 feet apart
- ❖ Cool down – before entering building after play time or exertion

◆ Cleaning & Disinfection

- ❖ Protective equipment
- ❖ Use of safer products
- ❖ Protocols

◆ Technology

- ❖ Remote vs Seat time
- ❖ Touchless controls
- ❖ Portable air purifiers

Protective Measures

Universal protective measures can play an important part to reduce exposure and spreading of infectious airborne particles like the coronavirus.



[Wash hands](#) frequently with soap and water for at least 20 seconds. [Video](#)^{11, 12}

How to [select](#) and [wear](#) a mask. Masks should have two or more layers if unable to maintain 6 feet physical distance.^{13, 14, 15, 16} Use [personal protective equipment correctly](#) according to product and job specific tasks.

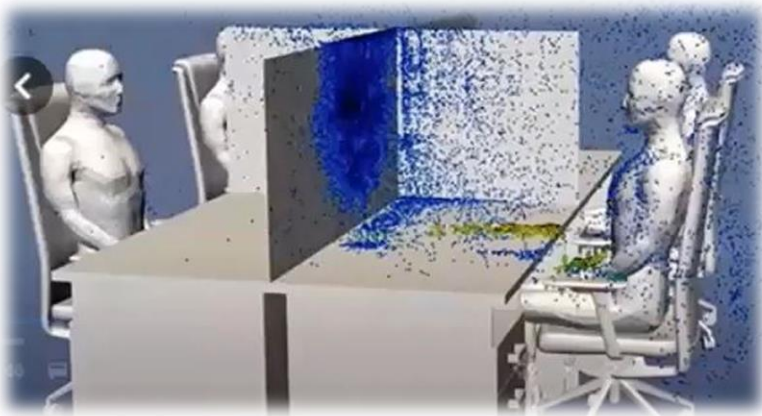


[Social Distance](#) and [Classrooms](#) - Keep a safe distance, 3 feet (classrooms) to 6 feet (adults) of distance away from others who are not from your household; if not possible to maintain distance, wear a mask.^{8, 17} Stay home if sick - coughing, fever, aches, not feeling well...

Healthy Buildings



Keep [ventilation system](#) and [vents clear](#), and declutter for easier cleaning and disinfecting.^{18, 19}



According to [healthy building design for pandemics](#), the height of partitions should reach above head and expiratory level, but not impede air flow in an indoor space.²⁰ Partitions should be cleaned often.

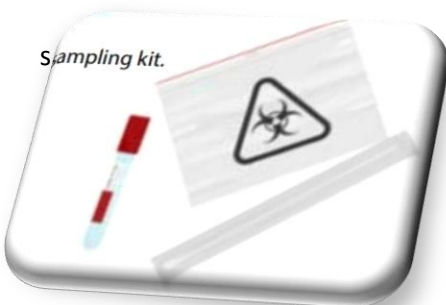
Sources: Sugiura N. The Asahi Shimbun. Jun 2020 and McDonald C, Hammond D, Kimmons JE, CDC. Partner Call: Healthy Building Design for Pandemics and Beyond. Nov 2020

Marketed technologies offer promise [filtration guidance](#) but continue to be evaluated, see [core recommendations](#) for reducing airborne infectious aerosol exposure.





[Cleaning](#) should be done prior to [disinfection](#). Children should not use cleaning products. Use [safer](#), effective [disinfectant](#) products according to labels.^{21, 22, 23, 24, 25} [Cleaning and disinfecting homes](#) and [cleaning away COVID](#) provide additional information.



[Basic testing](#) primarily includes two types of tests for [COVID-19](#): *Viral* (i.e., test for current infection) and *Antibody* (i.e., looks for antibodies from a past infection).^{26, 27} Following a positive viral test, [contact tracing](#) lets additional people know they may have been exposed and should monitor their health.²⁸



[Vaccines](#) have been shown to be highly effective at preventing [COVID-19](#), reduce the severity if infection occurs, and protects others.^{29, 30} [COVID-19 vaccines](#) and [vaccination](#) offer the best protection against COVID-19.³¹

The Pediatric Environmental Health Specialty Units (PEHSUs)

The PEHSUs are a federally sponsored network of interdisciplinary pediatric environmental health specialists based at academic medical centers around the country. The Healthy Schools Program, led by environmental hygienists, has been working for 15 years to assist school districts and childcare organizations in developing effective strategies for long-term improvement of indoor environmental conditions in school and childcare facilities. Together, we are working hard to provide the most up-to-date guidance around maintaining healthy school environments during the COVID pandemic as well as beyond. Please note that through this service we are not providing medical advice, but general guidance and recommendations based on our areas of expertise – environmental hygiene (best practice standards around building health), environmental health, and public health. Please reach out to us through either the [Children’s Mercy \(CM\) Kansas City School Health Portal](#) or by email to the [CM Healthy Schools/PEHSU Collaborative Service](#) staff. Of note, all our schools’ inquiries are anonymized and made public through the portal. Please use the portal as a resource to find answers to your questions as well. Thank you so much to all the schools for reaching out to us, whether through the CMH School Health Portal, or by email.

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ATSDR does not endorse the purchase of any commercial products or services mentioned in PEHSU publications.

Glossary

Cleaning: The physical removal of dirt and germs from surfaces or objects by using soap or detergent and water and should precede disinfection. Dilutes the number of germs on a surface.

Disinfection: Uses chemicals to kill germs on surfaces or objects. Following label, particularly product and contact time instructions, is vital to kill microorganisms. Use appropriate PPE.

Dew Point: The temperature to which air must be cooled to become saturated with water vapor and achieve a relative humidity of 100%.

Relative Humidity: The amount of water vapor actually in the air, expressed as a percentage of the maximum amount of water vapor the air can hold at the same temperature.

Sanitizing: Makes a surface free of germs (bacteria, viruses, and fungi) that could be harmful to health.

Ventilation: The process of supplying air to or removing air from a space for the purpose of controlling air contaminant levels, humidity, or temperature within the space

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<https://www.childrensmercy.org/departments-and-clinics/pharmacology-and-toxicology/environmental-health-specialty-unit/>

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