



Schools and COVID-19  
Healthy Environments  
**PEHSU Consultative Service**

Frequently  
Asked Questions

Dear Reader,

Thank you so much for visiting the frequently asked environmental questions related to COVID-19. This summary includes questions received most often through the [Children's Mercy \(CM\) School Health Portal](#), or the [CM Healthy Schools/PEHSU Collaborative Service](#). 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. The PEHSUs are a federally sponsored network of interdisciplinary pediatric environmental health specialists based at academic medical centers around the country. 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. Should you have further questions, please reach out to us through either the [CM School Health Portal](#) or through our website. 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 additional questions as well.

The most frequently asked environmental health questions from schools are categorized in this summary. To assist your search, we offer a glossary and recommend using the Control F (Ctrl F) function and the topic of interest using the key words below. Please note where brand names were mentioned, phrasing has been *italicized* and replaced with descriptive language.

- Air cleaners
- Bleach
- Cleaning (buses, desks, floor, spray bottles, towels)
- Clean Air Delivery Rate (CADR)
- Contact time
- Dwell time
- Disinfection
- Fans
- Filtration
- Fogging device
- HEPA filters
- HVAC
- Hypochlorous acid
- MERV filters
- Microfiber
- Needle Point Bi-Polar Ionization
- Open windows
- Personal protective equipment or PPE
- Playgrounds
- Quaternary ammonia
- Sanitizing
- Sani-wipes
- Touch point surface
- Ultraviolet light or UV Light
- Volatile organic compounds or VOCs
- Zip walls



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## *Cleaning and Disinfecting*

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### **Healthy Schools Inquiry**

We are considering using **spray bottles** and **towels** to clean **desks** between classes. What, if anything, should we consider or be aware of? (*July 2020*)

### **Response**

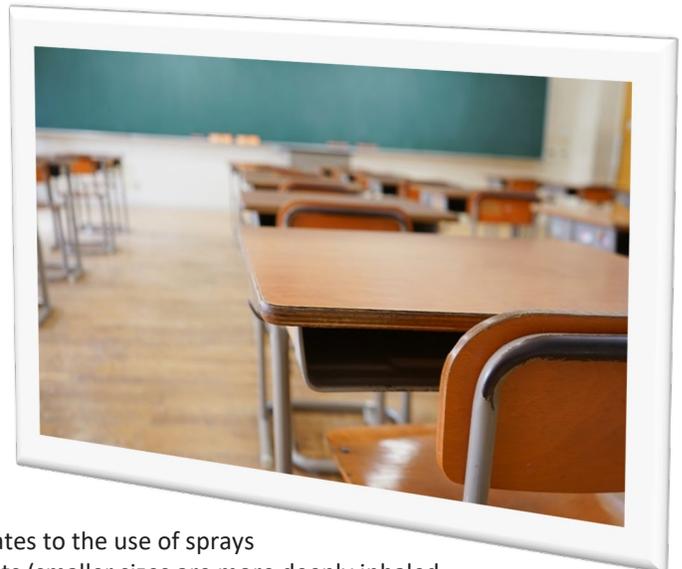
For **cleaning** and **disinfection**:

- Always follow label directions
- Review safety data sheet of chemicals in use
- Wear appropriate **personal protective equipment** (PPE) (e.g., gloves masks, eye protection, etc.) depending on product being used
- Children should not use products and products should not be used when areas are occupied
- Do not combine products
- Assure adequate ventilation to avoid inhaling vapors
- Clean first, then disinfect
- Clean with **microfiber** towels/cloths prior to disinfecting; fold towel in half and then in half again for eight clean surfaces
- Use safer disinfectants in amounts specified in the label
- Apply disinfectants to pre-cleaned surfaces; surfaces should be wet for entire dwell time or contact time
- Consider rinsing to remove residues
- Wash hands for at least 20 seconds after removing gloves
- Store products away from students



**Contact time / dwell time**, is the amount of time the surface needs to be visibly wet to effectively destroy the virus. Recently, a researcher indicated that the same towel or wipe should NOT be used from desk to desk, continuing to research for a definitive conclusion and recommendation for this question.

The discussion above is in regard to routine cleaning and not cleaning for a suspect- or known- positive COVID-19 case, which would require additional levels of cleaning and disinfection. In this case, the specific items associated with a student (desks, chairs, etc.) may be cleaned and disinfected using separate and multiple cloths to prevent the spread of the virus.



Another possible concern related to your proposed process relates to the use of sprays during the day. Depending on the size of the aerosolized droplets (smaller sizes are more deeply inhaled into the lungs), sprays may expose both staff and students to a respiratory irritant, which could cause or exacerbate symptoms in asthmatics and others with respiratory sensitivities. Spray cleaners and disinfectants should be used with appropriate PPE and when the space is unoccupied. This is also where application techniques to the towel rather than the desktop may be considered to minimize the introduction or aerosolized droplets into the occupied spaces if it is going to be cleaned on an hourly basis throughout the day. Perhaps other application modifications could be made to minimize occupant exposure. It is a must for the product to remain on surfaces and items for the manufacturers recommended contact or dwell time to be effective.

### Healthy Schools Inquiry

We have been approached by a representative for a **floor cleaning** system that requires a specific product, and are considering purchasing it. Have you heard of this product and can you tell if we should consider it for use in our facility? (*August 2020*)



### Response

Currently there are only two (*common brand*) products to date that have specifically been tested to be effective against the SARS-CoV-2 virus. All

products on the U.S. Environmental Protection Agency (EPA) [List N](#) are approved to be effective against other strains of coronavirus and other viruses and are believed to be effective against the SARS-CoV-2 virus. The same would apply to this floor cleaning system.

Many companies are advertising products and services that have not been proven to be effective against the SARS-CoV-2 virus, specifically. At this time, no devices have been proven effective in eradicating SARS-CoV-2. The cleaning and disinfecting chemicals known to be effective are on the EPA provided N list – use the N-list. This floor cleaning product may be effective at eliminating SARS-CoV-2, if it is effective at eliminating coronaviruses or other viruses that are similar in structure or nature to the SARS- CoV-2 virus.

### Healthy Schools Inquiry

We've heard about a product that utilizes **hypochlorous acid** at low concentrations to kill the SARS-CoV-2 virus on surfaces, can it be used to kill or prevent the spread of virus on skin? (*November 2020*)

### Response

Considerations regarding hypochlorous acid (HOCl):

Hypochlorous acid exists in a theoretical pH range of around 4-6. If the pH of the product increases (for example: hypochlorous acid in aqueous form is unstable and does not last as a liquid). When applied on the skin, the product comes in contact with other substances, or when it comes in contact with air, or any combination of these) it turns into hypochlorite, which is essentially **bleach**. Bleach can react with organic matter to release **volatile organic compounds** (VOCs) which can trigger airway problems such as asthma. In a pool, when chlorine comes into contact with skin oils and other bio effluents, it turns into chloramines, which is what you smell when you walk into an indoor pool area. Hypochlorous acid may not be harmful to the skin, but if that transforms into a dilute bleach solution (as pH increases), that could be a serious skin irritant (to the skin or the airway) depending on concentration of hypochlorite on the skin. If ingested, may cause burns to the mouth, throat, and gastrointestinal problems (e.g., nausea and vomiting) or if splashed in the eyes may cause conjunctivitis and other eye issues.



### Healthy Schools Inquiry

Good morning. Any thoughts on wrestling products that will kill COVID that can be wiped onto the skin if wrestlers don't have access to showers? What about best products for cleaning mats? Are there differences between soap and water cleaning vs. disinfectant and sanitizer use? (*October 2020*)

### Response

First some definitions:

**Cleaning** refers to the process of physically removing dirt and germs from surfaces or objects by using soap (or detergent) and water. **Sanitizing** reduces germs on a surface or object to meet standards as not to affect health. **Disinfection** refers to

the use of chemicals to kill germs on surfaces or objects.

If soap and water are not available, the U.S. Centers for Disease Control and Prevention (CDC) recommends using an alcohol-based [hand sanitizer](#) that contains at least 60 percent ethanol (also known as ethyl alcohol). The US Food and Drug Administration regulates hand sanitizers and has discovered serious safety concerns with some hand sanitizers. We recommend you check the [FDAs do-not-use list](#) prior to purchasing and using hand sanitizers.

In terms of wiping down mats, we would suggest products from [EPA's List-N of Disinfectants](#). The school and/or district can enter in the product name or EPA Pesticide registration number to find out if their products are on the approved product list. The N-list also has information regarding product composition, dwell or contact time, and other relevant information.

Here are some links to additional information on [simple detergent](#) use and [safer disinfecting for schools during the COVID-19 pandemic](#). The American Academy of Pediatrics (AAP) also released a document regarding [safe schools](#) and cleaning/disinfecting/sanitizing surfaces.

For wrestling mats, we recommend using dishwashing detergent and water, diluting 1 teaspoon of detergent with one cup water. Use in an 8 oz spray bottle, with which there would be little to no respiratory hazard. You can use this solution on most surfaces.

1 teaspoon detergent / 1 cup water in 8 oz spray bottle  
OR  
1/3 cup detergent / 1 gallon water in a bucket

### **Healthy Schools Inquiry**

Are there any disinfecting products/processes that can be used on our **playgrounds**? (September 2020)

### **Response**

Guidance is offered to schools regarding healthy activities such as [recess and equipment](#), [playgrounds](#), and [outdoor play spaces](#). In researching possible options for cleaning and disinfecting playgrounds, there is not an ideal solution. However, there are possible options to consider such as products that could be applied that may provide longer protection than traditional cleaning/disinfecting products.

*Antimicrobial technology* may provide long term protection on high touch surfaces

- Label indicates traditional cleaning/disinfecting processes may affect the efficacy of these products
- Outdoor weather and UV lighting could significantly impact the efficacy of the product

*Nano-crystal technology* - which are "skins" that are embedded with disinfecting properties that can be applied to high touch surfaces.

- 1) Equipment can be cleaned and wiped down
- 2) Outdoor weather and UV lighting may significantly impact the efficacy of the product
- 3) The product of interest does not refer to outdoor use, only indoors

Cleaning/disinfecting playground equipment only works or is beneficial for the first group to use the equipment, so the value of cleaning and disinfecting the equipment every morning is limited. However, cleaning the equipment along with good hand hygiene will be helpful to limit the spread of SARS-CoV-2 and other pathogens.

### **Healthy Schools Inquiry**

I am a local pediatrician and my children's grade school and our church are using a *self-cleaning surface product*. The product is described as "utilizing mineral nano-crystals which create a powerful oxidation reaction. Working 24/7, the surface continually oxidizes organic contaminants. Unlike traditional disinfectants and cleaners, these products on the surface uses no poisons, heavy metals or chemicals, and nothing is released from the surface since the nano-crystals are molecularly bonded to the material." *The product* is marketed as a continuously self-cleaning surface. I am skeptical of this product and wonder if you have any information or opinion about it? (October 2020)

### Response

The products are **touch point surface** applications (doors, door handles, floor mats, etc.) and routinely touched surfaces (mouse pads, place mats, etc.). There are minimal hazards associated with the products ([Safety Data Sheets](#) (SDS)). A SDS is a document the manufacturer, importer, or distributor is required to provide users to ensure those who handle the chemicals have the hazard information needed to safely use, handle, and store the product.



Of note:

- The products contain a proprietary titanium dioxide mixture that is reported to be non-toxic. Since it is "embedded or bound" in the products and it is <1% of the product composition, it should not be a significant hazard (see SDS for titanium dioxide)
- The SDS indicates that these products active chemicals are considered "articles" and therefore exposures are not expected. Nevertheless, Section 10 of the SDS also has a category called "Hazardous Decomposition", which includes by-products carbon dioxide, carbon monoxide, and other hydrocarbons. I would NOT expect any of the levels associated with product decomposition to be hazardous or of concern.
- Information generated from second- or third-party research that provide scientific results regarding product efficacy and test results to support the minimal risk is preferable. There is a reference/advertisement for this [technology](#) (page 10 of the 44-page document) that indicates a 6-log reduction in bacteria on surfaces treated with this line of products. Those are excellent results, but the research is missing.
- Finally, there is no available information proving this technology is effective against the SARS-CoV-2 virus. Like many of the disinfectants on EPA's List-N of approved products, they have not been proven effective specifically against the SARS-CoV-2 virus, but they have been proven effective against other human coronavirus strains. Other pertinent information indicates that the surfaces covered in this product must be cleaned routinely for the anti-microbial component of the wrap to continue working. The manufacturer recommends that the product(s) be reapplied quarterly, or more often if obvious wear is present.

### Healthy Schools Inquiry

A lot of the athletic training companies that carry *popular brand sani-wipes* are either not carrying them anymore or are telling us it's going to be a while for backorder. The schools pay for the supplies so it's not like we can order through a hospital. Are there alternatives that would provide the same level of disinfection? (August 2020)

### Response

Products similar to the *popular brand of sani-wipes*, in terms of a contact time of 2 minutes and primary active ingredients of [quaternary ammonia](#) or [isopropyl alcohol](#) include:

- Disinfecting Wipes
- Wipes for use on non-porous surfaces and fixtures
- Disinfectant Deodorizing Cleaning Wipes
- Disinfectant Towelettes
- Wipes or Max Wipes
- Sanitizing and disinfectant wipes and towels



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## *Devices*

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### **Healthy Schools Inquiry**

We've been approached about a **fogging device** that is purported to eliminate SARS-CoV-2 virus on surfaces and we're wondering what experience you have with these devices and whether or not we should consider purchasing them? (August 2020)

### **Response**

These devices aerosolize chemicals, or suspend them in the air, and the chemicals can stay in the air for long periods of time, especially if the area is not well ventilated. Aerosolizing a disinfectant can irritate the skin, eyes, or airways of people nearby and can cause other health issues for people who inhale it. Therefore, ventilation is extremely important. The Centers for Disease Control and Prevention does not recommend for or against these devices, but does recommend caution if using [foggers/misters](#) or other devices.

Several concerns about using sprayers/misters/foggers should be considered:

- Depending on how close to re-occupancy the product is being applied, fine aerosolized mists may still be present in the area when it is re-occupied, which could impact sensitive individuals such as people with asthma. Ideally, if using one of these devices, a product would be applied during evening custodial activities and then occupancy would not occur until the next morning, which should give the ventilation system time to remove any aerosolized mists that may have been introduced into the occupied spaces.
- Most products being applied will have respiratory hazards associated with them, so the applicator should use a respirator and other **personal protective equipment** as well as receive training on proper use to prevent unnecessary exposures.
- These sprayers/misters/foggers need to apply enough compound to thoroughly wet surfaces which must remain wet for the required product dwell or contact time. Otherwise, the product will not be effective at removing 99.9% of virus or as specified by the manufacturer.
- Some products leave residue behind after fogging. Residue should be removed before children use surfaces.
- As with any disinfectant, regardless of delivery method, the label instructions should be read and followed and precautions taken – clean prior to disinfecting, PPE, distribute enough product to thoroughly wet surfaces, follow dwell time, possibly rinse to remove residues, use clean surface of towel, and wash hands after removing gloves.

### **Healthy Schools Inquiry**

The school my children attend is considering purchasing **Needle Point Bi-Polar Ionization** technology for their facility. Have you heard of this product/technology and would you recommend the school purchase these devices? (October 2020)

### **Response**

In a recent ASHRAE COVID-19 [filtration guide](#), alternative disinfecting technologies including Photo Catalytic Ionization, Needle Point Bi-Polar Ionization, various ultraviolet (UV) technologies, etc., were reviewed. There is currently not enough third party or peer-reviewed research that supports the claim that these devices decrease the risk for COVID-19. Additionally, their use often pose risk such as ozone release. Therefore, these technologies are not recommended for schools at this time. Portable [air cleaners](#) can help to remove contaminants and improve indoor air quality. These newer technologies do not replace traditional [heating, ventilation, and air conditioning \(HVAC\)](#) system [maintenance](#), upgrades, and good air flow.

### Healthy Schools Inquiry

From looking at the areas we have set up for isolation - how do you suggest we clean? Would we need to discard the plastic and put up new? That would take a lot of plastic, but we will do what we need to do. The **zip walls** were something shared in a webinar. (August 2020)

### Response

There are a couple of factors that may impact our recommendations, which would include:

- whether or not there are any supply, return or exhaust vents in the area enclosed by the zip-wall
- amount of time between patients in the sick room
- time each child spends in the area prior to their parents picking them up

Given these points, to clean I would recommend using a product that has a short dwell or contact time in sick room areas and follow the instructions of the disinfectant. Request occupants refrain from touching the zip walls.

Consider replacing zip wall:

- if staff feel they cannot effectively clean and disinfect these surfaces each night without damaging the plastic
- if the area had a student who was coughing and touched a large number of surfaces and items in the space
- at the end of each week

### Healthy Schools Inquiry

I didn't know our district was purchasing *fogger machines (fogging device)* but we did. I requested the product information. The safety sheet does not seem to provide much information. I have attached the safety sheet and a picture of the label. Would you please provide your thoughts on this product? It was purchased to be used in **buses**, but I also wonder if they are considering using it in the classrooms. One of the maintenance members asked me about an air cleaning device. I think he has a salesman telling him how great it would be. The maintenance person was interested in having it in our gyms and hallways. (August 2020)

### Response

The concerns with misters or any sprays for that matter, involve the introduction of aerosolized droplets into occupied spaces. This can be a respiratory hazard for sensitive individuals including people with asthma. So ideally there should be as much time as possible between the use of the misting device and when occupants re-occupy the space.

Also, there is no data to support that this *specific product/process* is more effective against the SARS-COV-2 virus than traditional cleaning processes.



News Release:  
Coronavirus (COVID-19) Update:  
Daily Roundup July 8, 2020  
<https://www.fda.gov/>

### Healthy Schools Inquiry

We are considering for purchase and use in our facilities **HEPA filters, Needle Point Bi-Polar Ionization** and other technologies – what are your recommendations? (August 2020)

## Response

First and foremost, we recommend following and trying to implement ASHRAE's three primary recommendations for ventilation during the COVID-19 pandemic, which include:

1. Increase system on time and disable "Demand" ventilation
2. Increase percentage of outdoor air depending on outdoor weather (i.e., cannot do with extreme temperatures or high relative humidity)
3. Upgrade filters to **MERV 13** (if systems have the capacity to handle this level of filtration)



Of note: The district should implement the above recommendations prior to purchasing or installing any additional filtration devices or technologies.

Since the onset of the COVID-19 pandemic, school districts have been aggressively approached with a variety of devices and technologies being marketed and sold as solutions to reduce airborne SARS-CoV-2 virus and transmission. Many of these devices are based on two primary technologies, UV lighting and some form of ionization (current trend is NeedlePoint Bi-Polar Ionization). A primary concern regarding the use of these technologies is the unintended generation of ozone as a by-product. Ozone is a known irritant.

Use of these new devices should be done with industry-set standards. These standards have yet to be developed for a school setting. Ultraviolet (UV) light bulbs, for example reach 30% efficacy after the first year; this is when ozone generation is more likely to occur.

Another important consideration is the actual placement of the devices. Use of UV lighting to reduce/eliminate bacterial, fungal, viral growth on cooling coils and drip pans within an HVAC system has been used for decades. However, because any particulate flowing through the HVAC system would only be exposed to the UV light for mere seconds, it is unlikely to be effective in destroying the SARS CoV-2 virus. Most health experts are recommending the introduction and use of portable [high efficiency particulate air \(HEPA\) filters](#) as a safe and effective way to mitigate risk by reducing airborne virus levels in the occupied spaces. This provides increased filtration in areas where **MERV 13** filters are not in use or where high-risk activities may take place (for example: singing in choir). A device with an appropriate **Clean Air Delivery Rate** for the size of the space is critical in selecting a HEPA filter.

In regards to the other devices, again we would recommend caution in purchasing any technologies that may generate ozone as a by-product. The devices you've mentioned appear to only utilize HEPA filtration and therefore, would reduce airborne viral load without the unintended generation of ozone.



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## *Heating, Ventilation, and Air Conditioning*

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### **Healthy Schools Inquiry**

I am a school principal. I had a quick question that I was hoping to gain your feedback on if it was possible. We are looking into trying to upgrade our interior air purification and filtration for classrooms in the winter season ahead, and I didn't know if there was any meaningful or impactful guidance that can be provided for schools on the efficacy of certain filtration systems as we look ahead at the spread of COVID-19 and influenza. Specifically, I didn't know if there was a recommendation for **HEPA filter** systems, or for certain **UV light** purification systems. As principals we are solicited as potential buyers for these things all the time and I didn't know if one was more useful or meaningful than another in prevent the spread of illness. *October 2020*

### **Response**

Based on your questions, we would offer the following advice/guidance.

In regard to **HVAC** filtration, as the filter efficiency increases or the higher the Minimum Efficiency Reporting Value (**MERV**), the more difficult for air to pass through the filter and ultimately creates static pressure on the back side of the filter which will cause the fan motor to work harder and harder, where it may eventually cause fan motor failure. The American Society of Heating, Refrigeration, and Air Conditioning Engineers ([ASHRAE](#)) have recommended schools upgrade HVAC system filtration to **MERV 13**, if possible.

Also, the school should consider purchasing free standing or portable **HEPA** devices which could be placed in locations where there are or where risk may be a little higher due to activities taking place in these locations concerns (clinic, COVID sick room, music room, etc.). The primary consideration for purchasing a HEPA Air Cleaner is what is called the **Clean Air Delivery Rate** (or CADR), which determines the size of the space the portable HEPA filter should be placed in (usually based on sq foot). Units should be purchased that are large enough for each space. Since most districts do not have money to purchase a HEPA filter for every single room in the building, we recommend the focus on what are deemed to be higher risk areas.

In terms of needlepoint bi-polar ionization, **UV** light installed in duct work, etc., at this point although these items look flashy and appear to offer solutions to the on-going pandemic, there is not a lot of scientific research to support the efficacy of these devices. If you are considering UV lighting as a possible solution, my recommendation would be that they be installed above or around the cooling coils, where fungal colonization and growth is most likely to occur.

### **Healthy Schools Inquiry**

We are considering adding **HEPA air cleaners** to our clinics to help prevent spread of virus in clinics, do you have any advice on these devices? *(August 2020)*

### **Response**

Several key points should be considered when purchasing high efficiency particulate air (HEPA) cleaners for your clinic(s):

- Avoid any devices that are advertised as "HEPA-like"
- Purchase a device that is advertised as true HEPA or it needs to provide effective filtration of 99.97% of particulates down to 0.3 um in size. This is the definition of a true **HEPA filter**.
- The key factor that needs to be considered when purchasing a device is to make sure the Clean Air Delivery Rate (CADR) is appropriate for the size and/or volume of the clinic or sick room. Residential HEPA air cleaners may not provide an appropriate CADR for the size of the space, so you may have to consider purchasing a larger, commercial unit. If your clinic or sick room space is relatively small, you may be able to get by with a smaller, residential unit.
- Maintenance of these units is crucial to maintaining high level performance.

Additionally, schools should also take measures in clinic areas and any COVID-19 sick/isolation rooms (Tier II ventilation), which may include:

- Using/upgrade existing exhaust ventilation in clinic, COVID-19 isolation room and adjacent restrooms, if present
- Installing portable room air cleaners with HEPA filtration
- Installing a negative air machine with HEPA filtration to create negative (-) pressure, which will prevent the aerosolized virus from being “pushed out” of these sensitive areas and moving into healthier areas of the facility.

### Health Schools Inquiry

Which Centers for Disease Control and Prevention (CDC) guidance(s) should we be most aware of? Staff are asking if they can use **fans or open windows** in their spaces, what would your recommendations be for these? (*Ongoing since July 2020*)

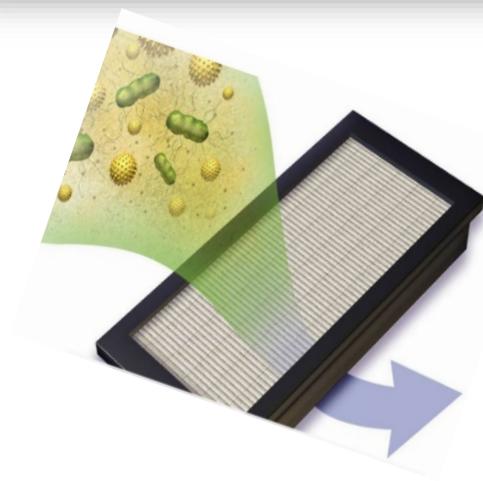
### Response

The CDC offers important guidance to schools related to COVID-19 including:

- [Operational Strategy for K-12 Schools through Phased Prevention](#)
- [Cleaning and Disinfecting Your Facility](#)
- [Ventilation in Schools and Childcare Programs](#) (fans / windows / exhaust fans)
- [Safety Precautions When Using Electrostatic Sprayers, Foggers, Misters, or Vaporizers for Surface Disinfection During the COVID-19 Pandemic](#)
- [Schools and Childcare Programs](#)

In terms of opening windows and using fans in classrooms, there are issues to consider:

- This could create unintended pathways of air movement that could increase the likelihood of exposure to the virus, if present in any spaces in the facility. There are existing and established air flow patterns created by the operation of **HVAC** systems during the occupied periods of the day. Adding fans to a room could drastically alter existing air flow patterns and create unnecessary exposures if air is blowing directly from one person to another or to a group.
- The addition of portable **HEPA** air cleaners/filters to a space (as you've done in the higher risk areas) is recommended because of the device's ability to capture and remove aerosolized particulates down to 0.3 um and even smaller. However, since most classrooms are assumed to have healthy, un-infected children and many are involved in less risky activities (no singing or other activities that would generate large amounts of respiratory aerosols), the addition of HEPA air cleaners/filters may not be needed in most "normal" situations.
- In areas with poor ventilation or no mechanical ventilation, you may consider opening **windows** (mild outdoor weather conditions and no safety concerns), operating a **fan**, and use of portable **HEPA** unit in each location.



**Example of Scare Tactic Marketing/Advertising:**

Dear School Representative,

I reached out to [a school staff person] for someone to speak to regarding the HEPA filters purchased or being purchased. Those can make the situation much worse! The HEPA filters are a decent (not great) solution to cleaning the air and removing SARS-CoV2. The problem is if they are being run during the day while people are in the building the increase in exposure is tremendous!

Think of it like a gravel road with a truck driving down. If there is no wind and you are standing 6 feet off the road you won't get too much dust on you even if you are there an hour. If, however, there is a wind, you will be COVERED in dust very quickly. The HEPA filters work by scrubbing the air through the filter. In order to do that, they suck the air in, thus pulling the dangerous pathogens across the room, across the desks to be breathed in by students and teachers. IT WOULD BE BETTER TO DO NOTHING THAN RUN THOSE DURING THE DAY!

There are solutions to treating the air and surfaces. We treat surfaces, we have "preferred vendors" that we can recommend to treat the air. I think for about the same price you could get the same system that is in the White House, UAE Presidential Palace, going in your schools, and currently in a test program at a large neighboring school district and working on a pilot for another district. We also have a preferred vendor that has FAR UV lighting that kills the pathogens even faster but that's a more expensive product.

I am a community resident and I don't want the national news to be about us being the new hotspot!

So be wary and careful of these scare tactics.

Luke Gard, CIEC, CMC, BOC

Mid America Pediatric Environmental Health Specialty Unit, Region 7

Safe and Healthy School Program Manager

Environmental Health Program |

Division of Toxicology and Therapeutic Innovation Children's Mercy Hospitals and Clinics

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### Acronyms

<b>AAP</b>	American Academy of Pediatrics
<b>ASHRAE</b>	American Society of Heating, Refrigeration, and Air Conditioning Engineers
<b>CDC</b>	U.S. Centers for Disease Control and Prevention
<b>CADR</b>	Clean Air Delivery Rate
<b>CM</b>	Children's Mercy Hospital
<b>COVID</b>	Coronavirus disease
<b>EPA</b>	U.S. Environmental Protection Agency
<b>HEPA</b>	High Efficiency Particulate Air
<b>HVAC</b>	Heating, Ventilation, Air Conditioning
<b>MERV</b>	Minimum Efficiency Reporting Value
<b>PEHSU</b>	Pediatric Environmental Health Specialty Unit
<b>PPE</b>	Personal Protective Equipment
<b>SARS-CoV-2</b>	Severe Acute Respiratory Syndrome Coronavirus 2
<b>SDS</b>	Safety Data Sheet
<b>UV</b>	Ultraviolet
<b>VOC</b>	Volatile Organic Compounds

## Glossary

**Air Filtration:** The process of removing airborne particles from the air.

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

**Clean Air Delivery Rate:** Number of cubic feet of clean air that an air filtration system delivers in a minute. Determines the size of the space the portable HEPA filter should be placed in based on sq footage. The higher the CADR number, the better the unit's overall ability to clean indoor air for the specified size space.

**Contact Time / Dwell Time:** The amount of time surface should be visibly wet to disinfect.

**Contaminant:** An unwanted particle with the potential to reduce the acceptability and quality of the air.

**Demand-controlled Ventilation:** Any means by which the outdoor air flow can be varied to the occupied spaces based on the number of occupants or ventilation requirements.

**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.

**Electrostatic sprayer:** A device that works by applying a small electrical charge to aerosols when passing through the nozzle. These charged droplets adhere or stick to environmental surfaces more easily.

**Fogger (or mister):** A device that uses a fan and a liquid solution to create a fog (aerosol with small droplets) or mist.

**Microfiber:** A fiber made of ultrafine synthetic yarns, often a blend of polyester and polyamide or nylon (i.e., plastic). The slightly positive charge helps attract and trap dust on surfaces and the high surface area makes this material absorbent.

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

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

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*The content in this resource represents the views of the author. It does not represent the views of Centers for Disease Control and Prevention (CDC)/ATSDR and does not represent endorsement by CDC/ATSDR of the purchase of any commercial products or services that are mentioned.*

### [Mid-America Pediatric Environmental Health Specialty Unit](#)

We hope that this frequently asked questions summary is useful and provided for general guidance and recommendations based on our areas of expertise, but should not be considered as support or endorsement of any specific product.

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