



# **Improving Indoor Air Quality in Schools for Better Health and Academic Outcomes**

**Tackling Air Pollution At School (TAPAS) Network  
Full Group Meeting  
March 9, 2023**

**Tracy Washington Enger  
Schools Program Facilitator,  
US Environmental Protection Agency**



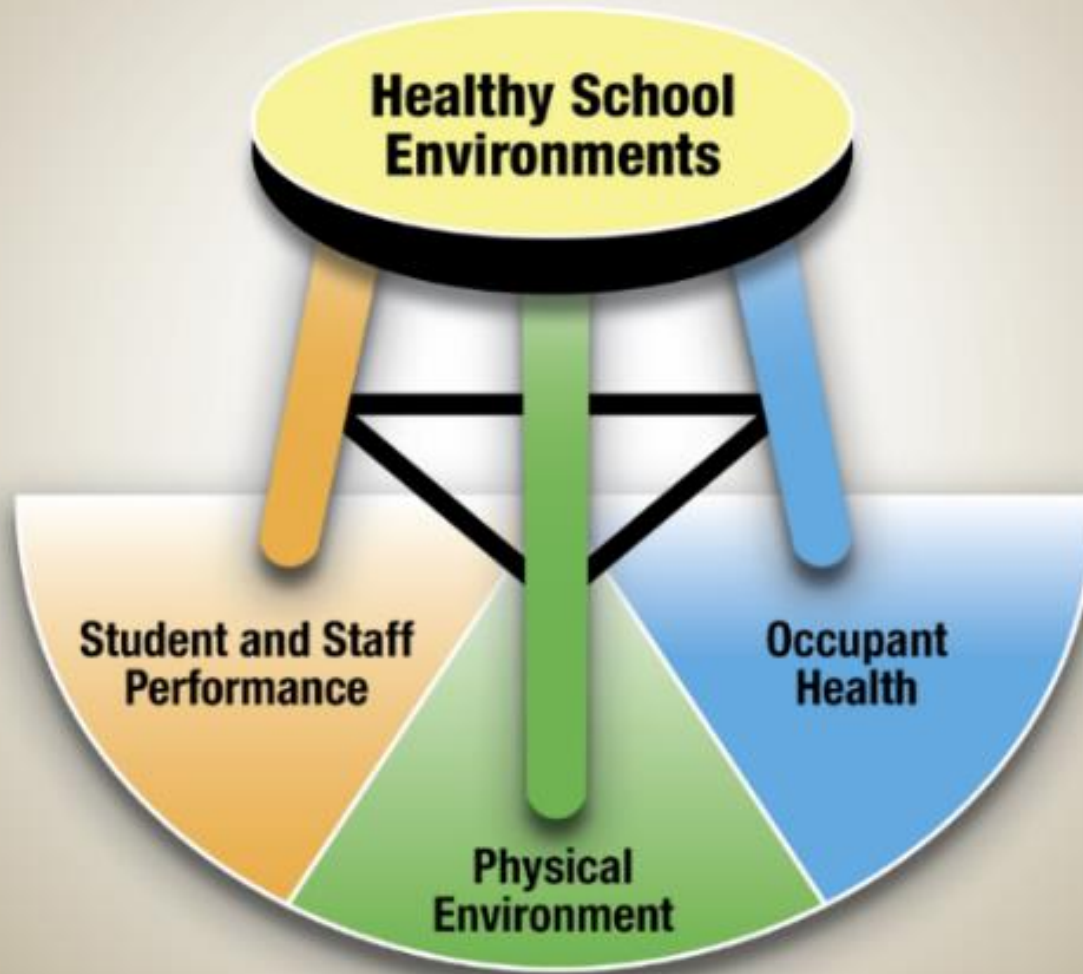
# Questions to Run On

- What are the key barriers for implementing changes in schools to achieve better air quality?
- How can we communicate and engage more effectively with schools?
- Can we define the size of the problem? (i.e. how many schools should be improving IAQ as a priority and can we estimate the impacts on health and attainment?)
- What is the best way to monitor IAQ and report the data in schools? (what to measure, for how long etc?)
- How can we manage IAQ in schools in tandem with other concerns (i.e. energy efficiency, timetabling etc.)
- Is the IAQ problem well understood before an intervention is proposed and how are schools measuring the impacts of interventions?



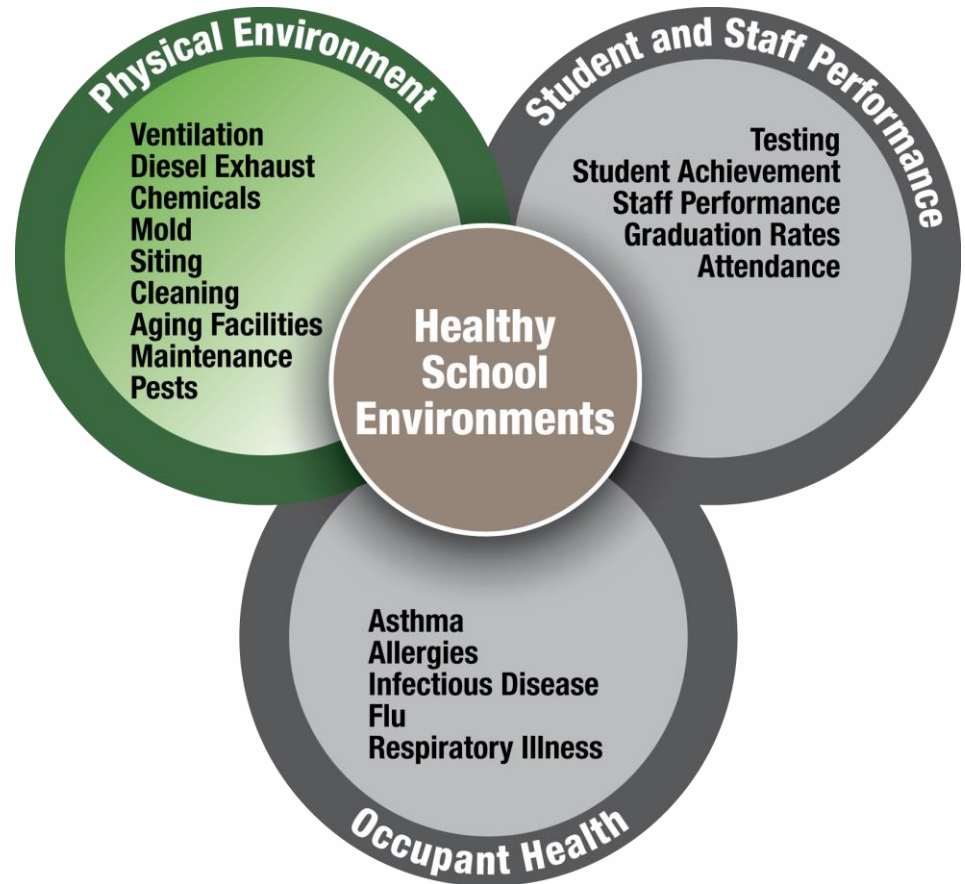


# The Three-Legged Stool: Creating and Maintaining Healthy Indoor Learning Environments



# Physical Environment

- The most recent data indicate that the average school in the United States is 55 years old.
- One-quarter of schools need extensive repair, and one-half of schools report complaints related to indoor air quality.
- The physical environment includes not just the age and repair of the building but also the methods used to maintain it regularly, such as cleaning and pest control chemicals.





- \$85 billion spending gap which leaves school districts unprepared to provide adequate and equitable school facilities
- Studies also have found that poor facilities are strongly associated with student truancy and higher rates of suspensions.

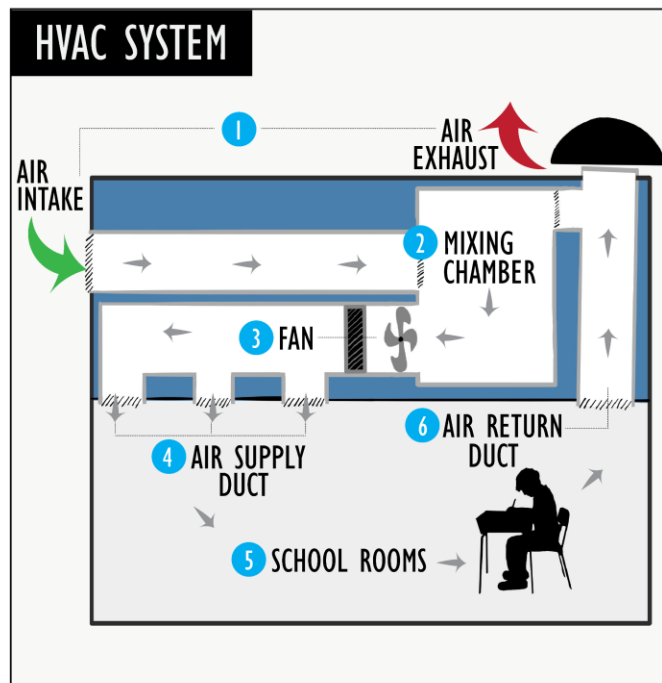
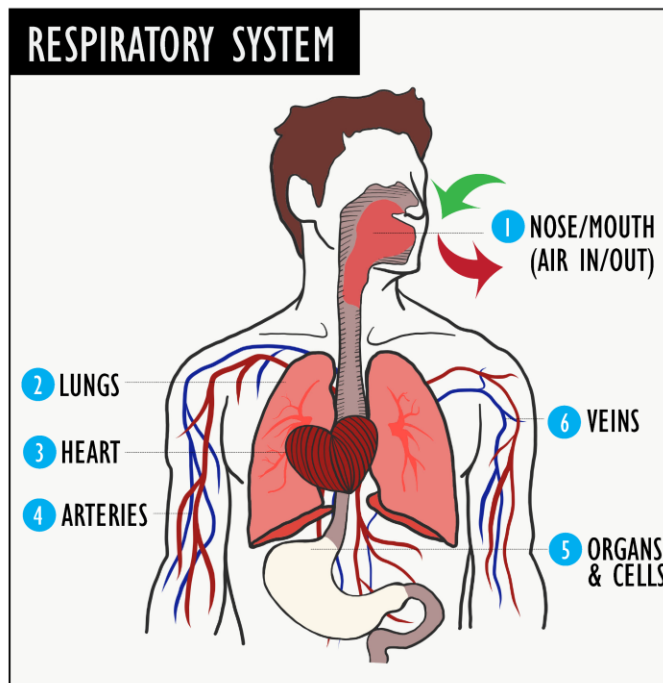


# IAQ Management and Respiratory Health

## IAQ management includes—

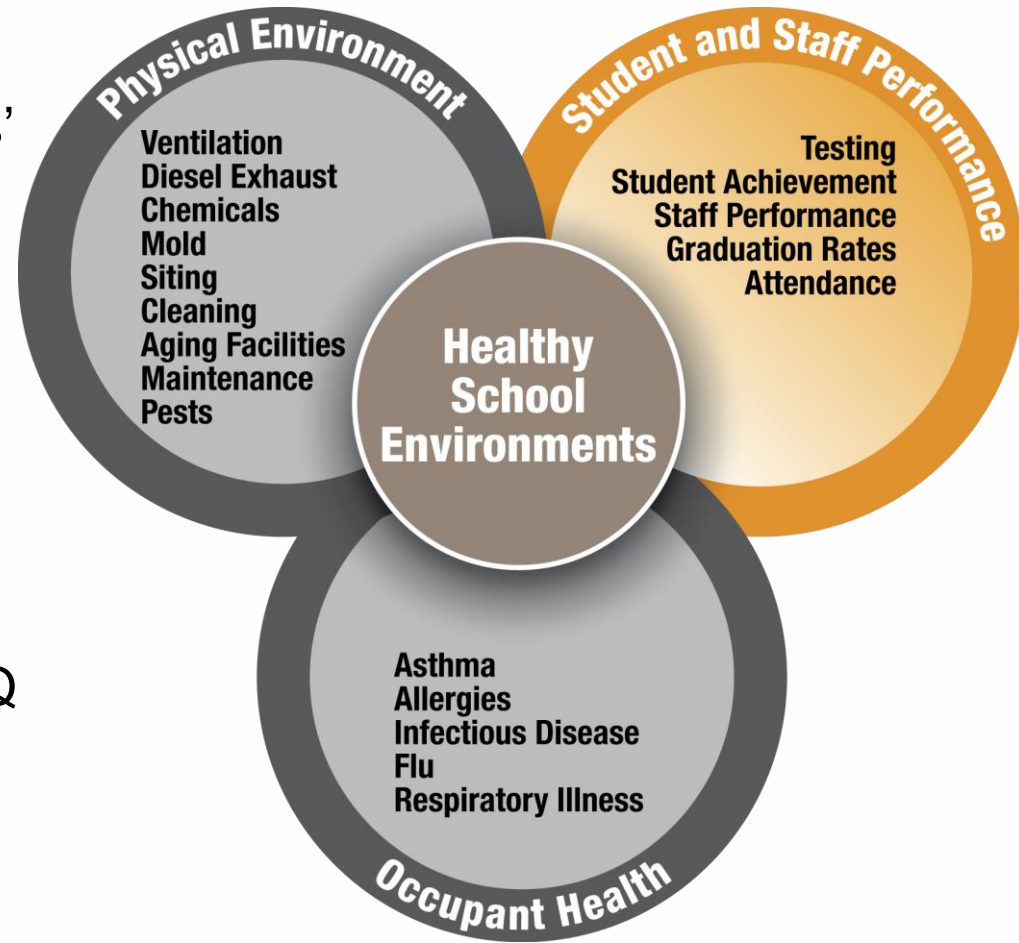
- Control of indoor air pollutants
- Ventilation and filtration
- Maintenance of acceptable temperature and relative humidity

**Ventilation** brings in outside air and exhausts building air, which dilutes the concentration of indoor pollutants. IAQ management practices also can help reduce the spread of viruses and other infectious diseases.



# Student and Staff Performance

- Health is directly related to students' and staff members' ability to think, learn and work.
- Studies have consistently shown that healthy indoor air helps students achieve higher test scores.
- Academic performance is a measurable way to demonstrate that improved IAQ has an effect.



# SCHOOLS + FOR HEALTH

## FOUNDATIONS FOR STUDENT SUCCESS

HOW SCHOOL BUILDINGS INFLUENCE  
STUDENT HEALTH, THINKING AND PERFORMANCE

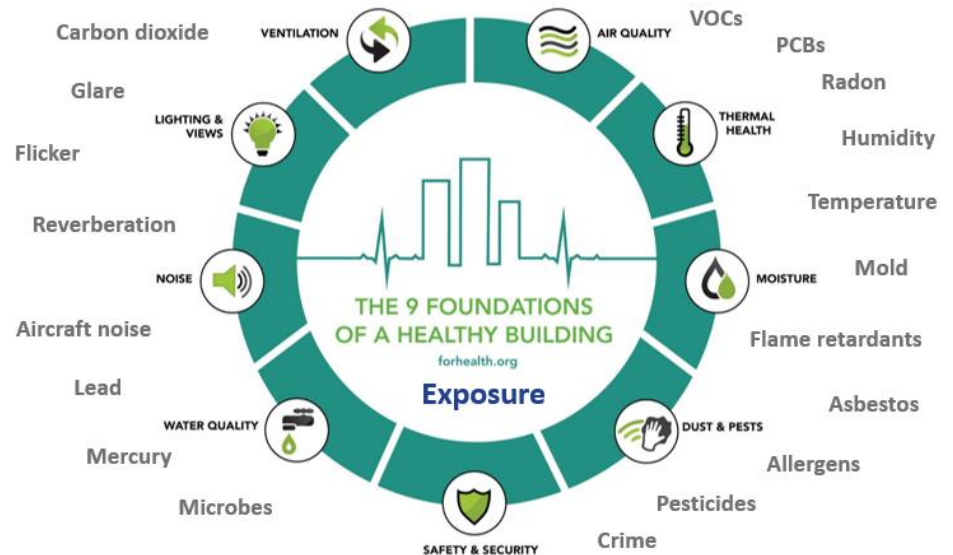


**HARVARD T.H. CHAN**  
SCHOOL OF PUBLIC HEALTH  
Center for Health and the  
Global Environment



## FOUNDATIONS

Health Performance  
Indicators for Buildings



**HARVARD T.H. CHAN**  
SCHOOL OF PUBLIC HEALTH

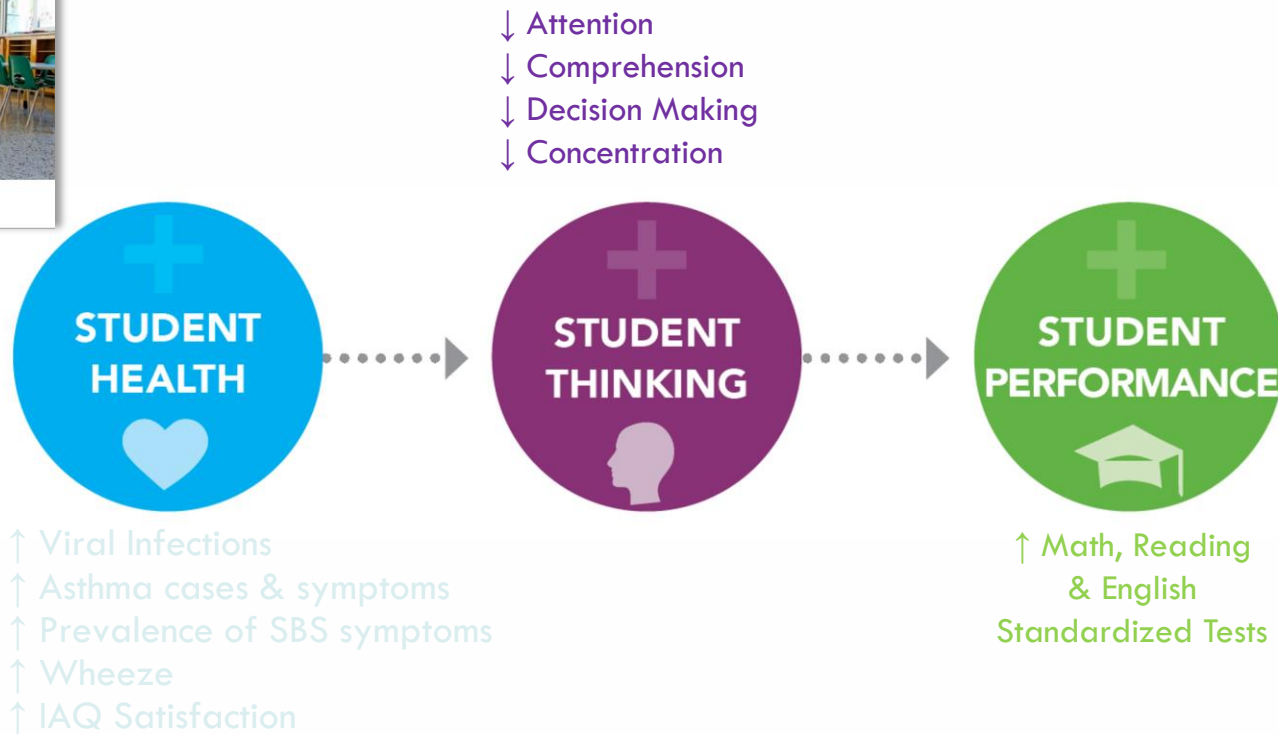


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Indoor Air Quality (IAQ)



# Impacts of High CO<sub>2</sub>



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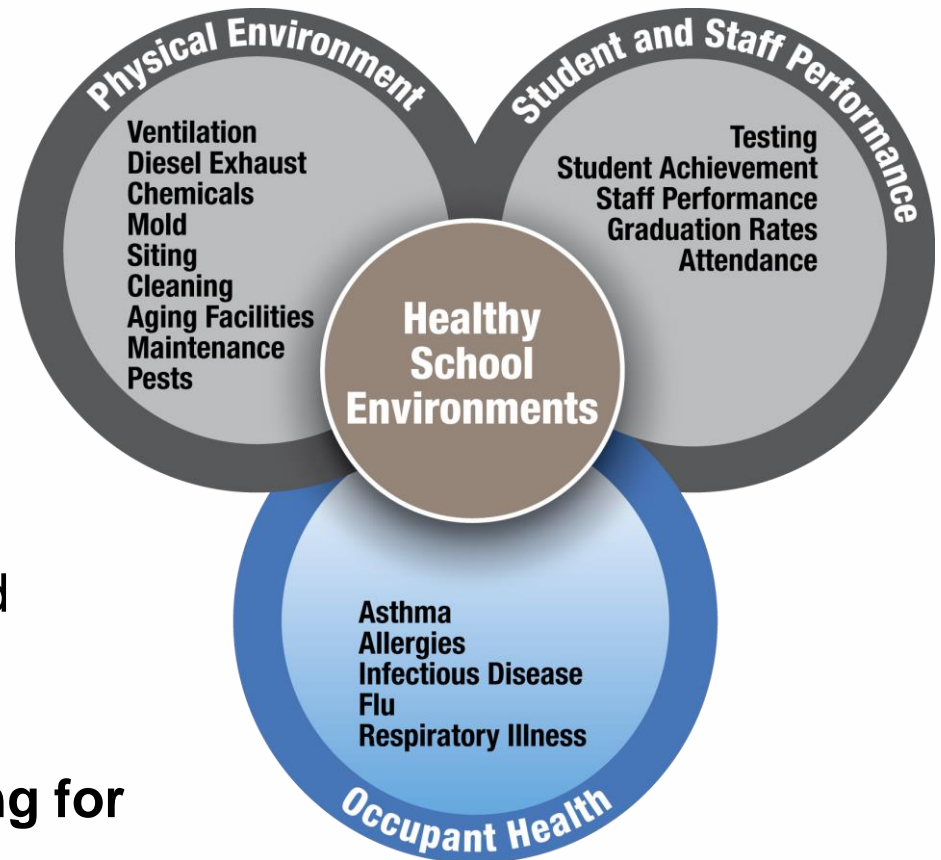
- Adequate lighting and good acoustics also help students remain alert and ready to learn.
- Students without access to daylight had disruptions in their production of hormones essential to learning.
- Students' ability to hear their teacher clearly has a substantial impact on their short-term memory and academic performance



# Occupant Health

Poor indoor air quality can cause or exacerbate many health problems:

- Coughing, sneezing and sinus congestion
- Irritation of the eyes, nose, throat and skin
- Headache, dizziness and nausea
- Allergies, shortness of breath and fatigue
- **Asthma is the leading cause of school absenteeism, accounting for 14,000,000 missed school days.**



# Healthy School Environments = ↑ Occupant Health

- Indoor air is typically 2–5 times more polluted—and in some cases up to 100-1,000 times more polluted—than outdoor air.
- Children breathe proportionately more air and may be more susceptible to pollutants than adults.
- Schools are often more crowded than other indoor spaces—on average, schools have four times the population density of a typical office.
- Staff could have long-term exposure.



# Asthma and IAQ in Schools

- More than 10 million school days are missed each year due to asthma.
- IAQ affects the health, productivity, performance and comfort of students, teachers and staff.
- Poor IAQ in a school building can cause students and staff to suffer adverse health effects, including respiratory infections, asthma and allergies.
- Indoor and outdoor environmental factors—including dust mites, molds, cockroaches, pet dander, secondhand smoke, and poor air quality—can trigger asthma attacks.



# Patient-Centered Medical Home



There are 2,584 School Based Health Centers that serve students and communities in 48 of 50 states and the District of Columbia and Puerto Rico.

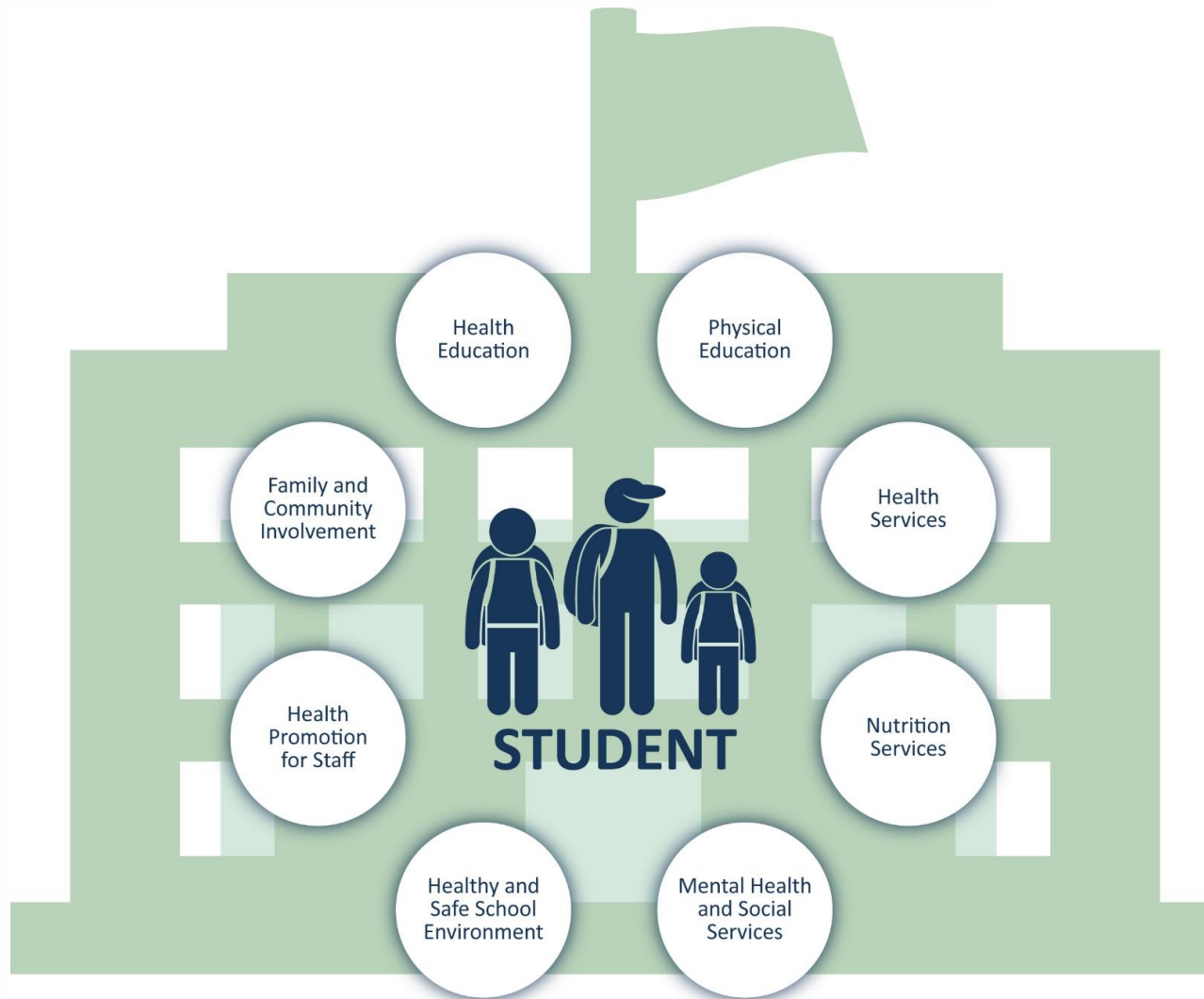


70% of students in schools with access to SBHCs are eligible for free or reduced-price lunch.



94% of SBHCs are located on school property

# Student-Centered Educational Home



# IAQ Tools for Schools:

## *What We Do*

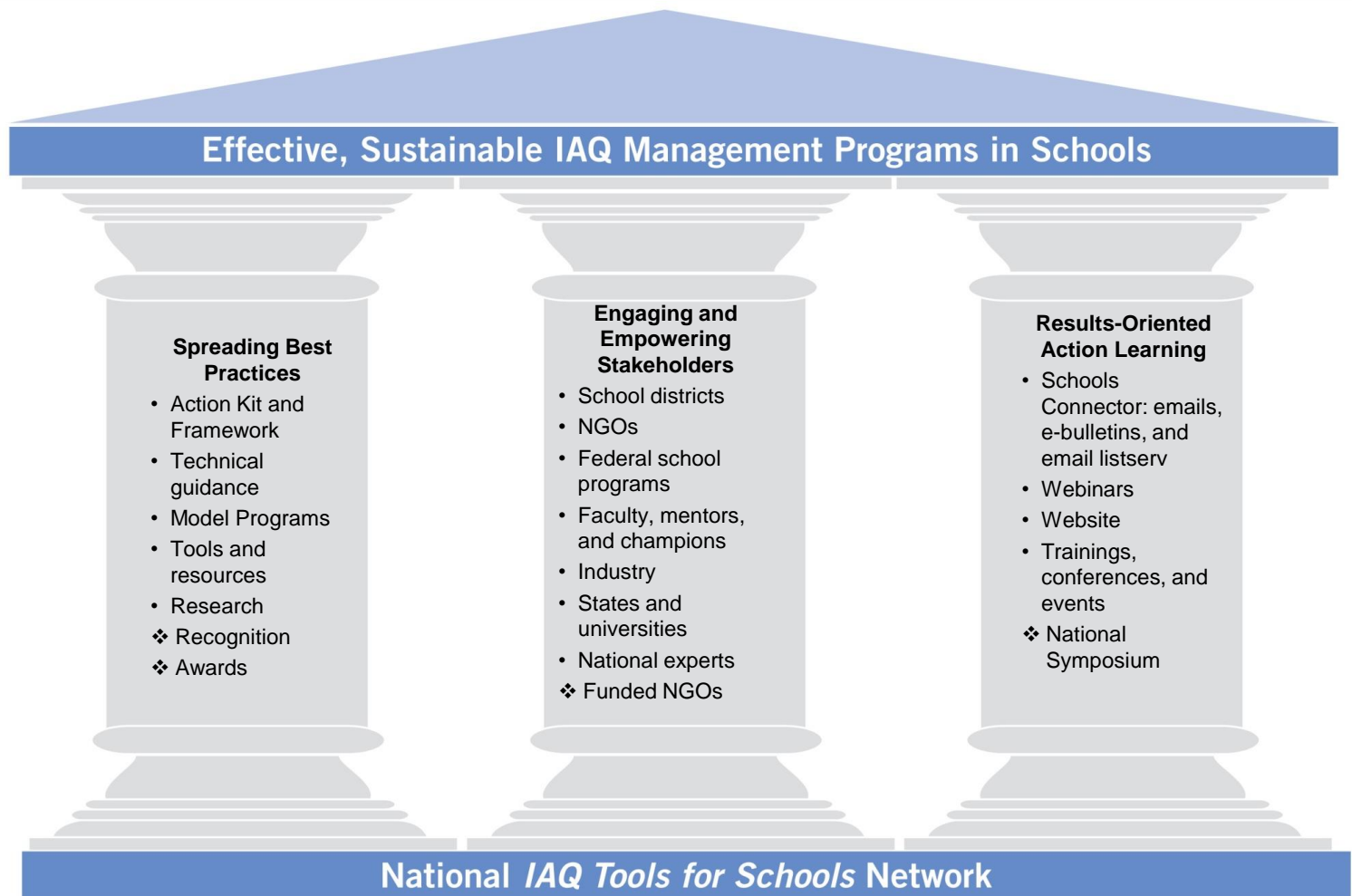


- Provide technical guidance, training, and resources to equip schools to launch, build, and sustain comprehensive healthy school management programs and implement healthy energy efficiency improvements.
- Take actions to target improved HVAC, mold and moisture control, integrated pest management, preventive maintenance, energy efficiency, radon and other environmental contaminants in the school setting.
- Maintain an array of partnerships with school and children's health organizations.
- Collaborate with federal partners to promote school environmental health.
- Host in-depth IAQ Professionals webinar training series.
- Communicate with the IAQ Schools Connector Network, comprised of 100,000+ school stakeholders.

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# Sustainable and Healthy IAQ in School Facilities



19



# EPA Resources to Get You Started!



**IAQ Tools for Schools  
Action Kit**



**IAQ Tools for Schools  
Mobile App**



**Framework for Effective  
IAQ Management**



**IAQ Master Class  
Professional Training  
Webinar Series**



**Energy Savings Plus Health Guide  
and Interactive Air Quality Planner**



**IAQ Tools for Schools:  
Preventive Maintenance  
Guidance**

[www.epa.gov/iaq-schools](http://www.epa.gov/iaq-schools)



# IAQ Tools for Schools Action Kit

**What is it?** A practical plan for improving your IAQ knowledge using straightforward solutions and individuals already on staff.

The Action Kit includes—

- Reference guides
- Checklists
- Fact sheets
- Sample policies
- Comprehensive IAQ management plans
- The Framework for Effective School IAQ Management
- The Seven Technical Solutions



# The Framework for Effective School IAQ Management: Six Key Drivers

## ORGANIZE

- Develop Systematic Approach
- Identify Existing Assets
- Design Standard Operating Procedures
- Empower an IAQ Leader
- Build an Effective Team
- Create Champions
- Secure Senior Buy-In

## COMMUNICATE

- Share Your Goals
- Make IAQ Meaningful
- Be Transparent and Inclusive
- Communicate Results (Return on Investment)

## ASSESS

- Walk the Grounds
- Listen to Occupants
- Use Technology
- Determine a Baseline
- Keep Customers Satisfied
- Identify and Prevent Risks

## PLAN

- Prioritize Actions
- Put Goals in Writing
- Start Small
- Work in Stages
- Plan for the Future

## Act

## ACT

- Educate Staff About IAQ to Change Behavior
- Train Occupants to Address IAQ Risks
- Address the Source of Problems

## Evaluate

## EVALUATE

- Solicit Feedback
- Capture Return on Investment
- Measure, Assess and Track Program Implementation
- Document Accomplishments
- Determine the Most Effective Strategies for Continuous Improvement

### ACTION KIT

- ★ HVAC
- ★ Moisture/Mold
- ★ IPM
- ★ Cleaning & Maintenance
- ★ Materials Selection
- ★ Source Control
- ★ Energy Efficiency





# KEY DRIVER: Assess Your Environments Continuously

## ASSESS

- Walk the Grounds
- Listen to Occupants
- Use Technology
- Determine a Baseline
- Keep Customers Satisfied
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# KEY DRIVER:

## Evaluate Your Results for Continuous Improvement

### EVALUATE

- Solicit Feedback
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Photo credits: Dave Blake and Rich Prill's images from the 2013 Virtual School Walkthrough Webinar



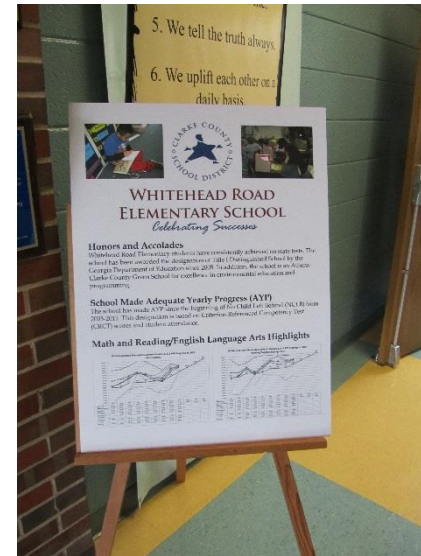


## KEY DRIVER:

# Communicate With Everyone, All the Time

## COMMUNICATE

- Share Your Goals
- Make IAQ Meaningful
- Be Transparent and Inclusive
- Communicate Results (Return on Investment)



# The Framework for Effective School IAQ Management: Seven Technical Solutions

## ★ Quality HVAC

- Inspect HVAC systems regularly
- Establish a maintenance plan
- Change filters regularly and ensure condensate pans are draining
- Provide outdoor air ventilation according to ASHRAE Standards or local code
- Clean air supply diffusers, return registers and outside air intakes
- Keep unit ventilators clear of books, papers and other items

## ★ Control of Moisture/Mold

- Conduct routine moisture inspections
- Establish a mold prevention and remediation plan
- Maintain indoor humidity levels between 30% and 60%
- Address moisture problems promptly
- Dry wet areas within 24–48 hours

## ★ Strong Integrated Pest Management (IPM)

- Inspect and monitor for pests
- Establish an IPM plan
- Use spot treatments and baits
- Communicate with occupants prior to pesticide use
- Mark indoor and outdoor areas treated with pesticides

## ★ Effective Cleaning and Maintenance

- Conduct routine inspections of school environment
- Develop a preventive maintenance plan
- Train cleaning/maintenance staff on protocols
- Ensure material safety data sheets (MSDS) are available to staff
- Clean and remove dust with damp cloth
- Vacuum using high-efficiency filters

## ★ Smart Materials Selection

- Maintain products inventory
- Develop low-emitting products purchasing and use policies
- Use only formaldehyde-free materials
- Use only low-toxicity and low-emitting paint
- Select products based on product rating systems
- Use least toxic cleaners possible (only those approved by the district)

## ★ Aggressive Source Control

- Conduct regular building walkthrough inspections
- Test for radon; mitigate if necessary
- Implement a hazardous materials plan (use, label, storage and disposal)
- Establish a school chemical management and inventory plan
- Implement smoke-free policies
- Establish an anti-idling school bus policy
- Use walk-off mats at building entrances
- Conduct pollutant-releasing activities when school is unoccupied

## ★ Integrated Energy Management Solutions

- Protect IAQ during energy efficiency upgrades and building renovations
- Conduct regular HVAC maintenance and tune-ups
- Install programmable thermostats
- Consider performing post-construction commissioning for HVAC systems
- Control moisture in building assemblies, mechanical systems and occupied spaces

## ACTION KIT

- ★ HVAC
- ★ Moisture/Mold
- ★ IPM
- ★ Cleaning & Maintenance
- ★ Materials Selection
- ★ Source Control
- ★ Energy Efficiency



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Outdoor Ventilation  
Filtration  
Relative Humidity  
Toilet Areas  
UVC and Air Cleaners  
Maintenance Personnel/practices



Photo credit: EPA Walkthrough of Langston Hughes Elementary School, New Orleans, LA



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# IAQ Preventive Maintenance: Guidance, Tools and Resources






EPA 402-K-18-001 | March 2019 | EPA Indoor Environments Division | [www.epa.gov/iaq](http://www.epa.gov/iaq)




## Indoor Air Quality Tools for Schools: Preventive Maintenance Guidance





### Indoor Air Quality (IAQ)

Preventive Maintenance Guidance



### Indoor Air Quality (IAQ) Tools for Schools: Preventive Maintenance Guidance Appendix B: IAQ Preventive Maintenance Model Plan

Model Plan<sup>1</sup>

## IAQ Preventive Maintenance Plan

[School District Name]

[Date]

*[Italicized sections in this Model Plan could be completed according to the instructions or simply deleted. The footer could be replaced with your school or district name, name of plan, and the date or version of the plan.]*

*[This could be a standalone IAQ Preventive Maintenance Plan, or you could add elements of this plan to your IAQ Management Plan<sup>2,3</sup> or your Preventive Maintenance Plan.]*

## Indoor Air Quality Preventive Maintenance Checklist

### Preventive Maintenance Full

Make a Copy of Checklist

Select and Customize a Checklist

Preventive Maintenance Full

Use Filters Below to Customize Checklist

School Name: \_\_\_\_\_

Date: \_\_\_\_\_

This tool is designed to allow you to add your own checks or modify the existing checks to match your needs. You may want to add additional activities related to IAQ preventive maintenance, such as those in IAQ Tools for Schools Action Kit. Enable macros to use this checklist customizer. Refer to Help files to learn how to enable macros for your version of MS Excel.

Category	Category Detail	Action	Priorit	Y	N	Notes
Project Planning	Project Planning	Gathered feedback from the school's faculty and staff on IAQ issues and gained an understanding of the current building status.	AP	<input type="checkbox"/>	<input type="checkbox"/>	
Project Planning	Project Planning	Performed a periodic building walkthrough inspection to identify environment health issues and concerns (recommend monthly inspections).	AP	<input type="checkbox"/>	<input type="checkbox"/>	
Project Planning	Project Planning	Clearly defined all IAQ and energy efficiency goals.	MA	<input type="checkbox"/>	<input type="checkbox"/>	
Mold and Moisture	Mold and Moisture	Inspected the interior and exterior of the building and the building's mechanical systems for evidence of moisture problems, and documented the results.	AP	<input type="checkbox"/>	<input type="checkbox"/>	
Mold and Moisture	Mold and Moisture	Determined whether the project requires mold remediation or additional moisture control measures based on the findings of the moisture inspection.	AP	<input type="checkbox"/>	<input type="checkbox"/>	
Mold and Moisture	Mold and Moisture	Worked with a general contractor or other experienced building experts to define the scope of moisture improvements and repairs.	AP	<input type="checkbox"/>	<input type="checkbox"/>	
Mold and Moisture	Mold and Moisture	Assessed moisture or mold problems that could not be resolved under the project. Did not start construction projects that would reduce the school's air infiltration rate if there are unresolved moisture problems.	AP	<input type="checkbox"/>	<input type="checkbox"/>	
Mold and Moisture	Mold and Moisture	Repaired moisture problems identified during the assessment including plumbing leaks, rain leaks, and foundation leaks.	MA	<input type="checkbox"/>	<input type="checkbox"/>	



Indoor Air Quality (IAQ)

# Steps to Develop and Implement an IAQ Preventive Maintenance Plan



## STEP 1

Make the Case to Gain Buy-In



## STEP 2

Develop Your Plan



## STEP 3

Form a Committed Team and Communicate for Success



## STEP 4

Evaluate for Continued Improvement



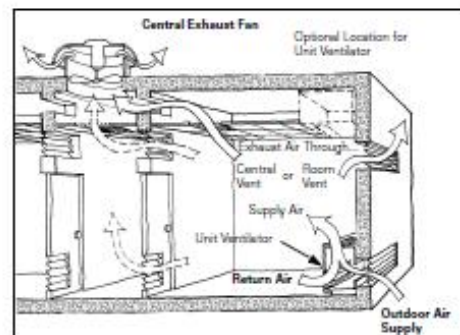
# HVAC and Reducing Airborne Transmission



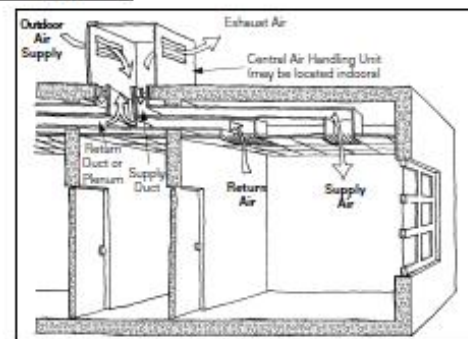
Centers for Disease Control and Prevention  
CDC 24/7: Saving Lives, Protecting People™

## COVID-19 can sometimes be spread by airborne transmission.

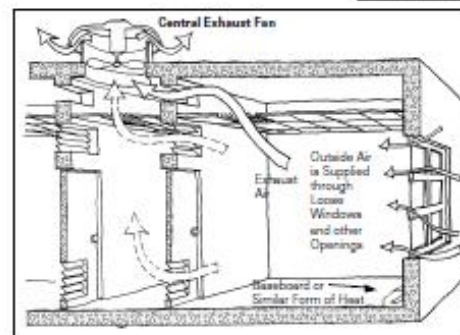
- Some infections can be spread by exposure to virus in small droplets and particles that can linger in the air for minutes to hours. These viruses may be able to infect people who are further than 6 feet away from the person who is infected or after that person has left the space. This kind of spread is referred to as **airborne transmission**.
- There is evidence that under certain conditions, people with COVID-19 seem to have infected others who were more than 6 feet away. These transmissions occurred within enclosed spaces that had **inadequate ventilation**.



Air Supply through a Unit Ventilator



Air Supply in a Central Air Handling System




Air Supply in an Exhaust-only System

# Proven Strategies to Improve IAQ in Schools Infographic


- Increase ventilation rate
- Increase HVAC filter efficiency
- Supplement with portable air cleaners



 **Proven Strategies to Improve Indoor Air Quality in Schools**


Putting strategies in place to ensure adequate ventilation and filtration in school buildings is critical for providing healthy indoor air to students and staff. To **reduce pollutants in the air and limit the spread of viruses and bacteria**, schools should maximize ventilation rates to the extent possible by bringing in as much outdoor air as weather and outdoor air quality permit. When sufficient HVAC adjustments are not possible, consider other means of bringing in outdoor air, and also consider increasing HVAC filter efficiency and using portable air cleaners as a supplemental filtration strategy.

### Increase Ventilation Rate



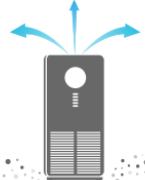
- Conduct an HVAC assessment to evaluate the condition of the existing HVAC system components and unit ventilation equipment.
- Ensure a scheduled inspection and maintenance program for HVAC systems is in place to allow for repair, modification or replacement of equipment.<sup>1</sup>
- Assess and service your ventilation system to ensure it continues to perform as designed.
- Adjust the HVAC system to bring in more outdoor air.
- When HVAC adjustments are not possible, consider other means of bringing in outdoor air, such as opening windows and using window fans, if weather and outdoor air quality permit.
- Keep unit ventilators clear of books, papers and other items that could reduce airflow.

### Increase HVAC Filter Efficiency




- Increase filter efficiency in existing HVAC systems by using filters with the highest Minimum Efficiency Reporting Value (MERV) rating possible (per equipment specifications). If possible, increase the level of the air filter to MERV 13 or higher.
- Make sure the filters are sized, installed and replaced according to the manufacturer's instructions.

### Supplement with Portable Air Cleaners



- Consider using portable air cleaners as a supplemental filtration strategy. Choose portable air cleaners that use proven technology and are appropriately sized for the spaces they will service. Replace filters according to the manufacturer's instructions.
- Do not use air cleaners that intentionally generate ozone in occupied spaces or that do not meet state regulations or industry standards for ozone generation.
- If air cleaners are used, they should be placed so that air is not blown directly from one person to another, as this could potentially facilitate the spread of viruses and bacteria to others. Air flow to and from air cleaners should not be obstructed.

<sup>1</sup> Ensure HVAC assessments and maintenance are in accordance with minimum inspection standards of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)/Air Conditioning Contractors of America (ACCA) Standard 180, ASHRAE handbooks, or other equivalent standards and guidelines.

[epa.gov/iaq-schools](https://www.epa.gov/iaq-schools) 

# Employ Proven Technologies



## COVID-19



Your Health

Vaccines

Cases & Data

**Work & School**

Healthcare Workers

Health Depts

Science

More



WEAR A MASK



STAY 6 FEET APART

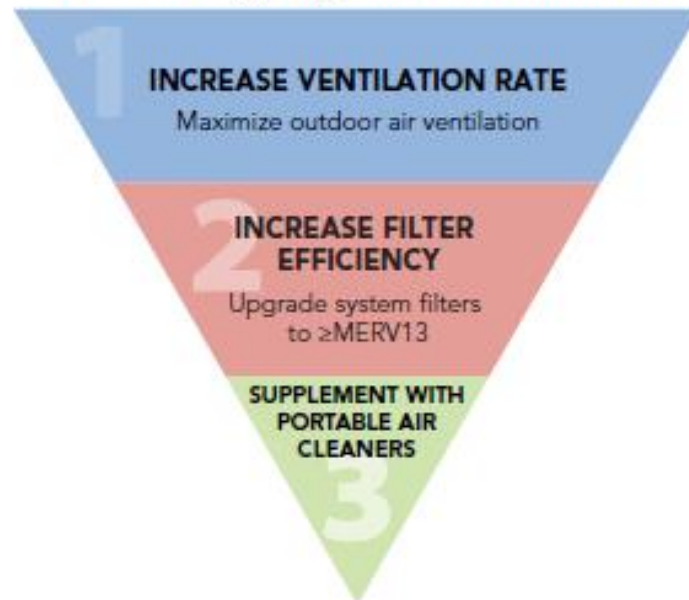


AVOID CROWDS



GET A VACCINE

### Prioritization of Engineering Controls to Reduce Long-Range Airborne Transmission



## Ventilation in Schools and Childcare Programs

How to use CDC building recommendations in your setting

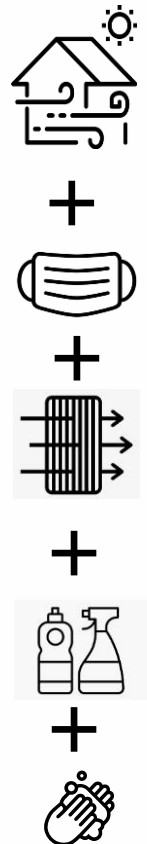
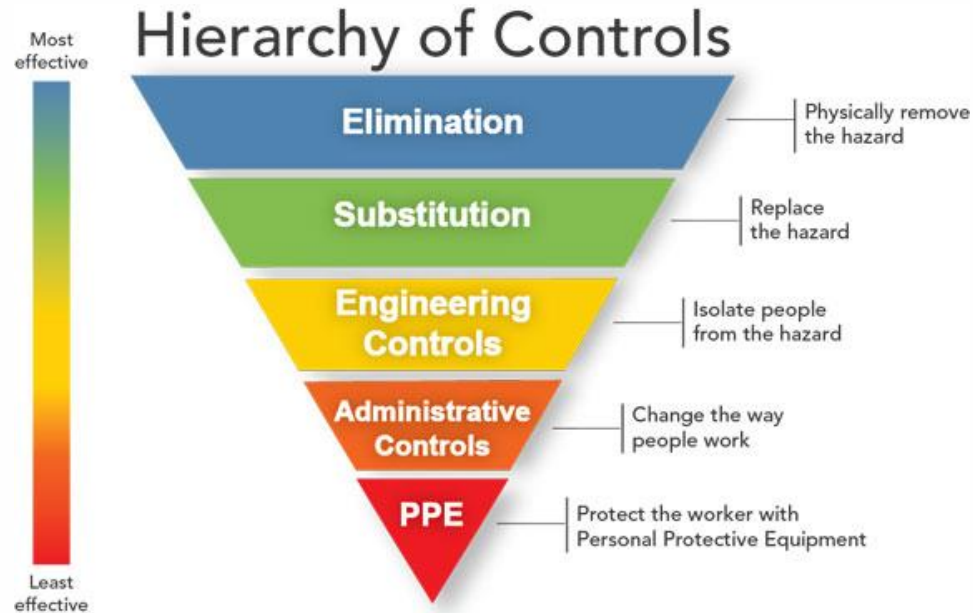
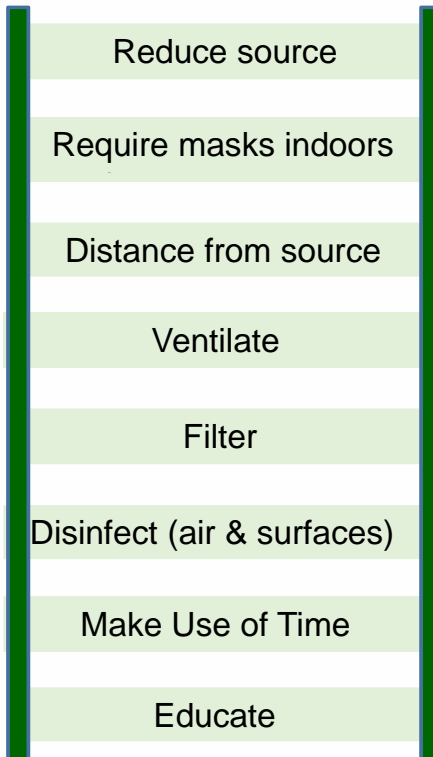


Opening windows, using portable air cleaners, and improving building-wide filtration are ways you can increase ventilation in your school or childcare program.

**Figure 2.** Source: Jones et al., 2020. *Schools for Health: Risk Reduction Strategies for Reopening Schools*. Harvard Healthy Buildings Program.



# Action Through Layered Risk Reduction



# EPA Resources for Responding to COVID-19 in Schools

**EPA** Great States Environmental Protection Agency

Environmental Topics | Laws & Regulations | About EPA | Search EPA.gov

Related Topics: Coronavirus | CONTACT US | SHARE | f | t | in

## Frequent Questions Related to Coronavirus (COVID-19)

View frequently asked questions related to Coronavirus (COVID-19) and find key EPA resources.

### Disinfectants

I can't tell if the product I'm interested in is on the list or not. Can you help me?

I want to use a product to kill SARS-CoV-2 but it isn't on List N. Is it effective against SARS-CoV-2?

[View all frequent questions about disinfectants and Coronavirus \(COVID-19\).](#)

### Drinking Water

Do I need to boil my drinking water?

Is tap water safe to use for hand washing?

Is drinking tap water safe?

[View all frequent questions about drinking water and Coronavirus \(COVID-19\).](#)

### Grants

May EPA waive prior approval requirements specified at 2 CFR 200.407 if a waiver is necessary to address COVID-19 related concerns?

What documentation does EPA require for resumption of non-competitive awards?

[View all frequent questions about grants and Coronavirus \(COVID-19\).](#)

### Indoor Air

Is there HVAC guidance that building and maintenance professionals can follow to help protect from COVID-19?

Will an Ozone generator protect me and my family from COVID-19?

Will an air purifier protect me and my family from COVID-19 in my home?

[View all frequent questions about indoor air and Coronavirus \(COVID-19\).](#)

### Questions from State, Local and Tribal Leaders

Can states expect any regulatory relief or flexibility if they temporarily suspend certain inspections, monitoring, and reporting requirements such as vehicle emissions testing programs or certain air quality monitoring reports under the Clean Air Act?

[View all frequent questions from State, Local and Tribal Leaders about Coronavirus \(COVID-19\).](#)

### Wastewater and Septic Systems

Can I get COVID-19 from wastewater or sewage?

Will my septic system treat COVID-19?

Do wastewater treatment plants treat COVID-19?

[View all frequent questions about wastewater and septic systems and Coronavirus \(COVID-19\).](#)

### Waste

Does RCRA regulate wastes that may contain the virus that causes COVID-19, such as used medical equipment or personal protective equipment?


Where can I find information regarding the handling of wastes associated with Coronavirus and COVID-19?

What information has EPA shared to provide the public, the regulated community and other government agencies with the most complete and up to date information on actions related to COVID-19?

[View all frequent questions about waste and Coronavirus \(COVID-19\).](#)

## GUIDANCE FOR CLEANING AND DISINFECTING

### PUBLIC SPACES, WORKPLACES, BUSINESSES, SCHOOLS, AND HOMES



SCAN HERE FOR MORE INFORMATION

This guidance is intended for all Americans, whether you own a business, run a school, or want to ensure the cleanliness and safety of your home. Reopening America requires all of us to move forward together by practicing social distancing and other [daily habits](#) to reduce our risk of exposure to the virus that causes COVID-19. Reopening the country also strongly relies on public health strategies, including increased testing of people for the virus, social distancing, isolation, and keeping track of how someone infected might have infected other people. This plan is part of the larger [United States Government plan](#) and focuses on cleaning and disinfecting public spaces, workplaces, businesses, schools, and can also be applied to your home.


**Cleaning and disinfecting public spaces including your workplace, school, home, and business will require you to:**

- Develop your plan
- Implement your plan
- Maintain and revise your plan

Reducing the risk of exposure to COVID-19 by cleaning and disinfection is an important part of reopening public spaces that will require careful planning. Every American has been asked to slow the spread of the virus through social distancing and prevention hygiene, such as frequently washing your hands and wearing face coverings. Everyone also has a role in making sure our communities are as safe as possible to reopen and remain open.

The virus that causes COVID-19 can be killed if you use the right products. EPA has compiled a list of disinfectant products that can be used against COVID-19, including ready-to-use sprays, concentrates, and wipes. Each product has been shown to be effective against viruses that are harder to kill than viruses like the one that causes COVID-19.

For more information, please visit: **CORONAVIRUS.GOV**



## List N: Disinfectants for Use Against SARS-CoV-2

All products on this list meet [EPA's criteria](#) for use against SARS-CoV-2, the virus that causes COVID-19.

### Finding a Product

To find a product, enter the **first two sets** of its **EPA registration number** into the search bar below. You can find this number by looking for the EPA Reg. No. on the product label.

For example, if EPA Reg. No. 12345-12 is on List N, you can buy EPA Reg. No. 12345-12-2567 and know you're getting an equivalent product.

[Search by EPA registration number](#)

### Other COVID-19 Resources

- [EPA's Coronavirus Site](#)
- [CDC's Coronavirus Disease 2019 Site](#)
- [CDC's Cleaning and Disinfection Recommendations for COVID-19](#)
- [NPIIC's COVID-19 Virus Factsheet](#)



Indoor Air Quality (IAQ)



# Professional Training Webinar Series

 Free Online Training,  
Earn CEUs!

## IAQ Master Class Series

10 technical trainings to build your knowledge base to start, improve or sustain an IAQ management program. Complete all 10 to join the IAQ Master Class.

## IAQ Knowledge-to-Action Series

Technical trainings to deepen your IAQ knowledge and build capacity to take immediate action.



### Technical Knowledge

- Asthma Triggers
- HVAC Systems
- Moisture and Mold
- Energy Efficiency
- Integrated Pest Management
- Cleaning and Maintenance
- Materials Selection and Source Control

### Capacity Building

- Funding and Gaining Buy-In
- Assessment and the IAQ Mobile App
- Staff Training
- Evaluation and Data

### Virus Mitigation

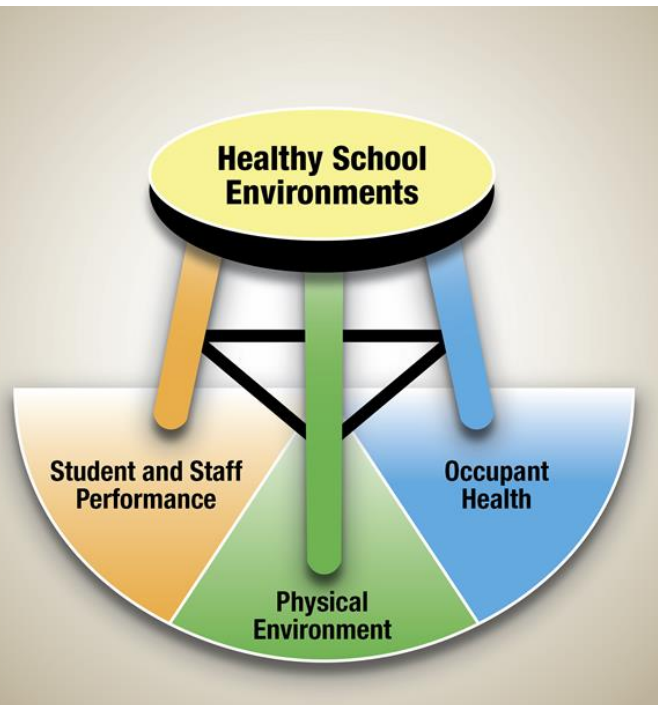
[www.epa.gov/iaq-schools/ondemand-training-webinars](http://www.epa.gov/iaq-schools/ondemand-training-webinars)

# The Value of IAQ Preventive Maintenance: Saving Costs with Healthy, Reliable and Efficient School Buildings



# What Is a Value Proposition?

***An analysis and quantified review of the benefits, costs and value that an organization can deliver to customers/funders and other stakeholders***



- A value proposition is a succinct statement (e.g., 2–4 sentences) that clearly describes the tangible results a customer gets from your program.
- A value proposition is an offer to someone in which they get more than they give up.
- A value proposition is the basic reasoning for why people should support your program.
- A value proposition uses tangible results to draw interest and share a success story within a few words.

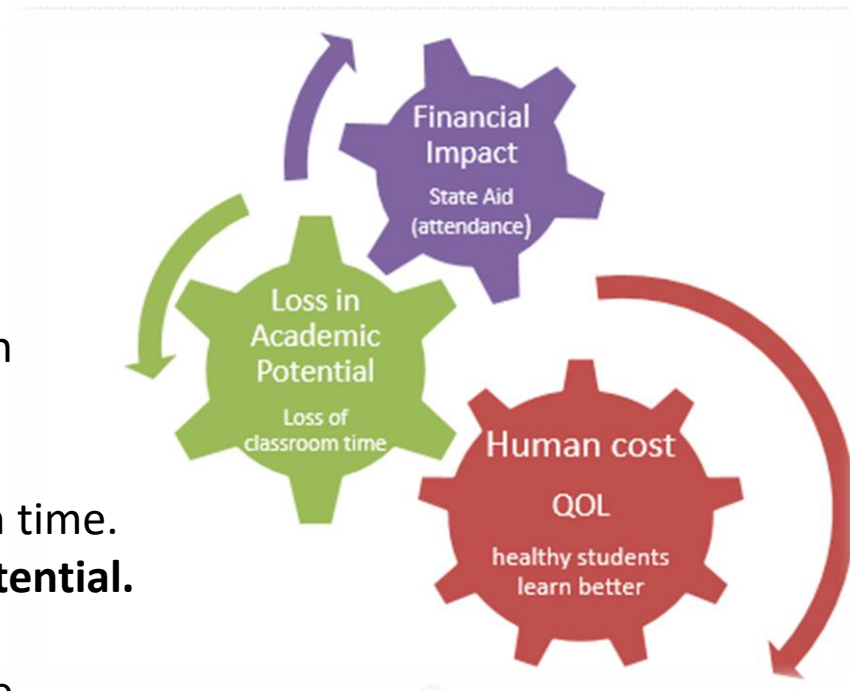
# Bold Goals Value Proposition Summary

## NEISD Asthma Awareness Education Program

**BOLD GOAL:** *Our program focuses on creating healthy learning environments for all students, including reducing asthma triggers, through comprehensive indoor air quality and asthma management.*

*Initial input cost of \$63,000:*

- Financial impact  
**REDUCTION** in annual **average number of school days missed** by 8,000 students with asthma. 1 day = \$267,552; 50% = \$1 million
- Academic impact  
**DECREASE** in asthma-related clinic visits.  
**REDUCTION** in loss of academic instruction time.  
Asthma students achieve **full academic potential**.
- Human impact  
**IMPROVED** quality of life, change in culture.





# Cleaning for Health Value Proposition

The bold goals our program is focused on include having a highly educated work force that is knowledgeable in and has bought into creating the healthiest, most sustainable learning environment possible and **creating a culture of leaders at all levels** who strive to always improve the standard of customer service and healthy environments.

By training and supporting our staff, **our personnel will be trusted and respected as the professionals they are for the students and patrons.** They will generate hundreds of thousands of dollars in not only avoided energy and waste costs, but also in labor and chemical costs in the next decade.



# The Story of America's Schools

- Desegregation
- Immunization
- Fighting Hunger



# Our Defining Moment



# Acting on Our Values



This is OUR defining moment!

What is the **Core (Care) Value** you are taking action to uphold in this moment?



# Thank You!



**Tracy Washington Enger**  
**Indoor Environments Division**  
**US Environmental Protection Agency**  
**[enger.tracy@epa.gov](mailto:enger.tracy@epa.gov)**

