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When Climate Events Force Us
Indoors



When Climate Events Force Us Indoors: Why Indoor Air Quality is Crucial to the Climate Conversation

September 16, 2026

Agenda

1. Welcome
2. Review of Public Act 103-0837
3. When Climate Events Force Us Indoors
4. Resources and Questions
5. Next Steps

When Climate Events Force Us
Indoors



Public Act 103-0837

Beginning with the 2026-27 school year, every public school shall provide instruction on climate change, which shall include, but not be limited to, **identifying the environmental and ecological impacts of climate change on individuals and communities and evaluating solutions for addressing and mitigating the impact of climate change and shall be in alignment with State learning standards, as appropriate.**

The State Board of Education shall, subject to appropriation, prepare and make available multi-disciplinary instructional resources and professional learning opportunities for educators that may be used to meet the requirements of this subsection (b).



When Climate Events Force Us Indoors

Why Indoor Air Quality is Crucial
to the Climate Conversation

September 16, 2026

Lisa Gebhard, MS
Manager | Nationwide Health Promotion



Check In #1

What is your current understanding of how **extreme heat** can impact lung health?

- A. No understanding
- B. A little understanding
- C. Some understanding
- D. High understanding



Rising temps = longer growing season for plants = longer allergy seasons

Floods = mold = allergen/asthma trigger

Floods & wildfire = displacement = access to healthcare/medication
regimens interrupted

Wildfires = smoke/particle pollution = bad air quality = unhealthy to breathe in

Heat = traps gasses = creates more ground-level ozone = lung irritant

Today's Goal:

Empower attendees with tools to advocate for healthier built and indoor environments for students



1. The Built Environment

- Understand extreme heat and heat islands
- Learn solutions schools can implement

2. Indoor Air Quality (IAQ)

- Define IAQ and name variables influencing IAQ
- Identify common indoor air pollutants and explain their impact health & learning
- Describe practical tips and strategies for improving IAQ in schools

Current City Norm

Dark, non-porous surfaces

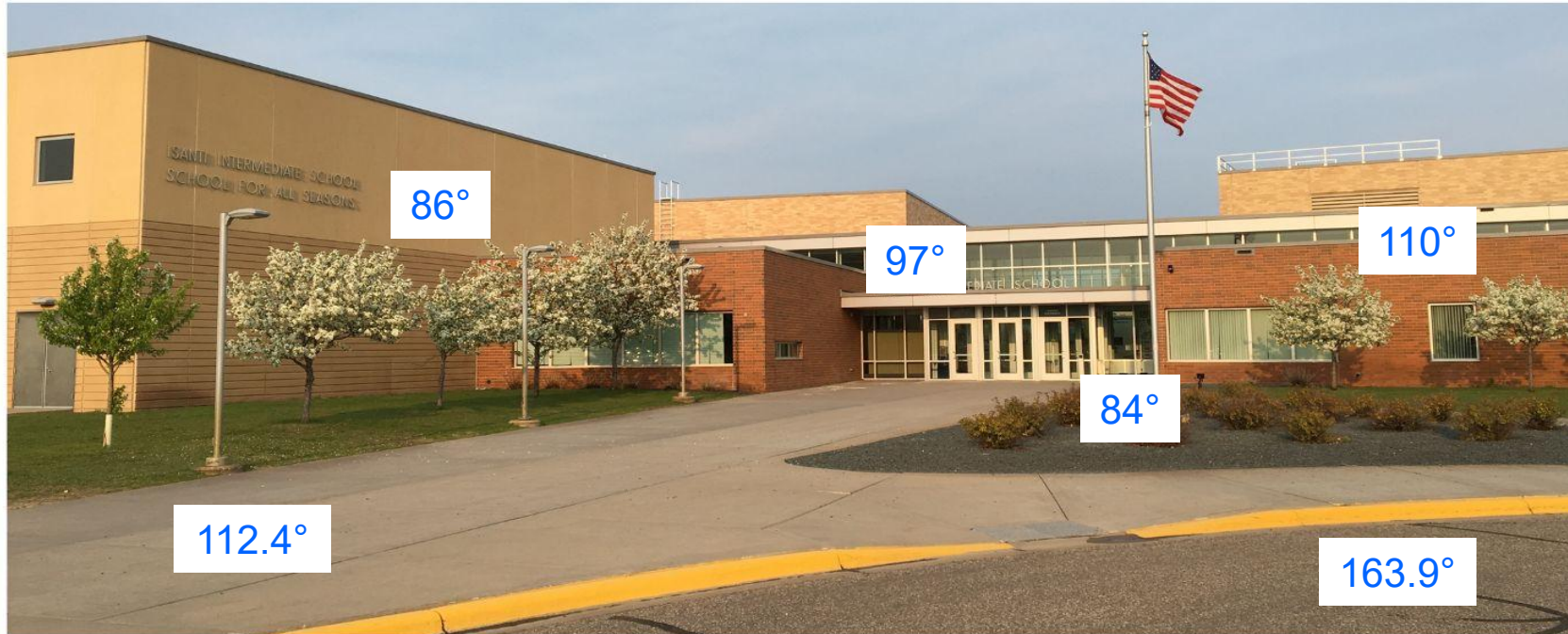


Two-thirds of U.S. cities are made of dark and non-porous surfaces, which contribute to:

- Urban heat
- Increased air pollution
- Flooding
- Poor health

Current Norm

Dark, non-porous surfaces



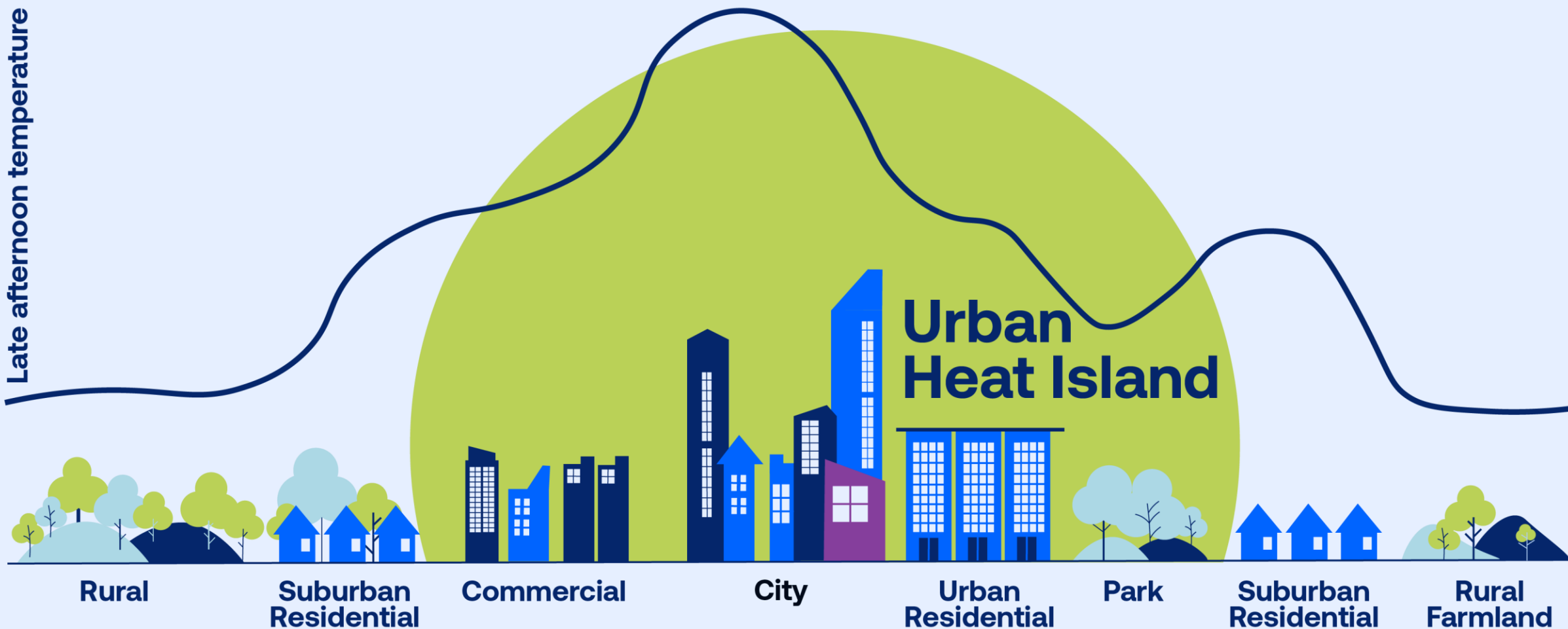
SMART
SURFACES
COALITION

Two-thirds of U.S. cities are made of dark and non-porous surfaces, which contribute to:

- Urban heat
- Increased air pollution
- Flooding
- Poor health

American
Lung
Association

Late afternoon temperature °C



Causes of Urban Heat Islands

- Reduced natural landscapes in urban areas (trees, vegetation, water bodies)
- Urban material properties and surfaces
- Urban geometry
- Weather and geography
- Heat generated from human activity



Urban Heat and Ozone Impact Lung Health

Nitrogen oxides and volatile organic compounds (VOCs) from industry and other sources react with heat and sunlight to create ozone.

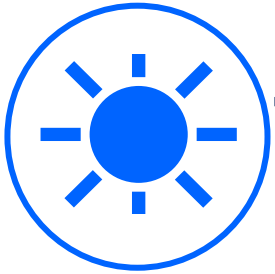
Ozone causes swelling and irritation of the lungs—much like getting a sunburn on your lungs. Repeated exposure may lead to permanent lung damage.



NOx + Heat and sunlight = Increased ozone = Reduced lung health

Excess Heat Increases Allergies

A 3-part punch



1- Shorter Winters, Longer Seasons

Warmer temperatures make pollen seasons longer.



2- Pollen Overload

As areas with cooler weather warm, pollen-producing plants can now grow there.



3- Pollen Potency

Increased CO₂ stimulates plants to increase production and release pollen.

Observed Climate Changes



Increased
temperatures



Increased
extreme
weather



Higher
dew points

Likely Events

Extreme Heat

Air Pollutants/Ozone

Longer Pollen Season

Severe Storms

Flooding

Changes in Environment & Habitat

Drought

Wildfires & Wildfire Smoke

Health Outcomes

Respiratory illness

Allergies

Heat-related illness
and death

Cardiovascular disease
and stroke

Injuries, drowning

Infectious disease

Stress and
mental illness

Displacement

Urban Heat is a Health Equity Issue

Low-income, Black, Indigenous, and people of color are most at risk

Denial of mortgages,
insurance loans, and other
financial services

Disinvestment and
redlining

Low-income urban areas
are 10-15* hotter in
summer

Energy costs account for
15% of income in lowest-
income households



Healthier City Vision

Reflective and green surfaces

Smart surfaces are a cost-effective solution to create a more livable community.



Light-colored, reflective road

- Reduced heat absorption, reduces ambient temperature
- Porous parking lanes manage stormwater and reduce runoff



Porous, reflective parking lot with trees

- Increased thermal comfort
- Shading and stormwater management

Reflective, green and PV roofs

- Reduced building and city temperature
- Reduced runoff
- Generating clean renewable energy

Smart Surfaces Examples

Cool Roofs



Green Roofs



Solar Photovoltaics



Cool Pavements



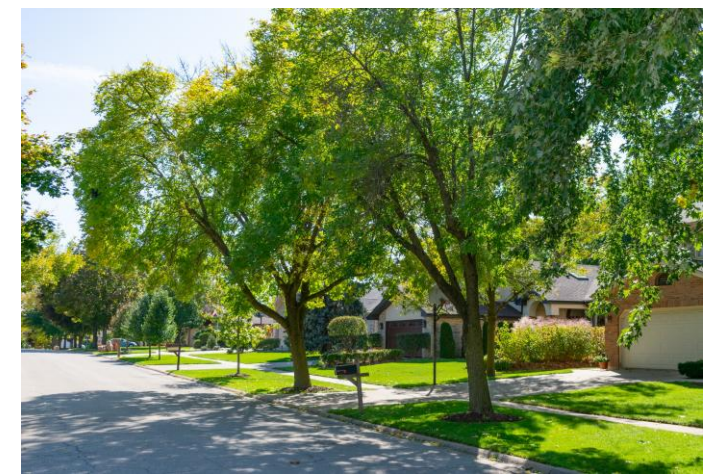
Trees and Rain Gardens



Porous + Permeable Pavements



What are Smart Surfaces? *cont'd*



Cool Roofs: A Cost-Saving, Climate-Resilient Alternative

Lighter-colored “cool” roofs reflect more incoming sunlight than dark-colored roofs, **reducing heat absorption.**

For low-slope roofs, many cool roof options are actually **lower-cost** when compared to conventional dark roofing materials.



Smart Surfaces School Guide and Case Study



Heat at School | Before Installing Smart Surfaces

While Rhode Island's air temperature may be 82°F, an unshaded playground can easily reach:

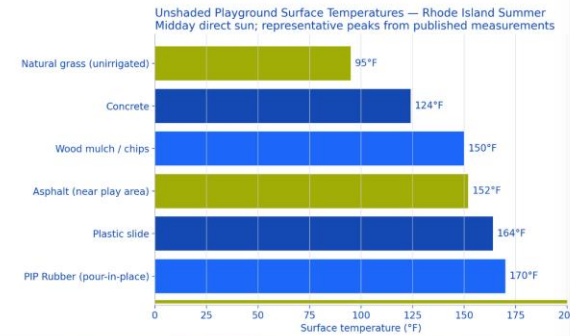
- 100–120°F on rubber surfacing
- 130–160°F on metal slides or platforms
- 20–40°F hotter than the surrounding air on average

Why it gets so hot

- Dark rubber and plastic absorb solar radiation.
- Metal amplifies heat dramatically.
- No shade means continuous direct sun exposure.
- Humidity (common in Rhode Island summers) increases perceived heat.

Quick summary

An unshaded Rhode Island playground in summer typically feels dangerously hot, with temperatures often 30–60°F hotter than the air. Even on an 85°F day, equipment can exceed which is hot enough to cause burns and heat stress.



Charlestown Elementary School, Prior to Shade Structure In



Testimonial from Chariho Regional School District

The Chariho Regional School District is undergoing a remarkable transformation with the use of Smart Surfaces to enhance comfort, safety, and overall well-being of our students and staff. In partnership with the American Lung Association's Smart Surfaces initiative, the District installed an outdoor shade structure at Charlestown Elementary School, the District has also begun strategic ally planting trees across campus and we have installed reflective window coverings which are bringing numerous benefits.



Charlestown Elementary School Shade Structure

The outdoor shade structure at Charlestown Elementary School has quickly become one of the most valued spaces on our grounds. It provides cool, reliable protection from direct sun, allowing students to learn, gather, and play outdoors even on the warmest days. We hope this will leave students less fatigued after spending time in shaded areas and show our district's commitment to creating healthier outdoor environments.

Available at Lung.org/smart-surfaces

Check In #2

What is your current understanding of how **indoor** air quality can impact lung health?

- A. No understanding
- B. A little understanding
- C. Some understanding
- D. High understanding

Why Indoor Air When Talking About Climate?



Protecting Lung Health on Poor Air Quality Days

1. Check local air quality
2. Limit time outdoors
3. Keep indoor air clean
4. Monitor symptoms and contact healthcare providers if necessary

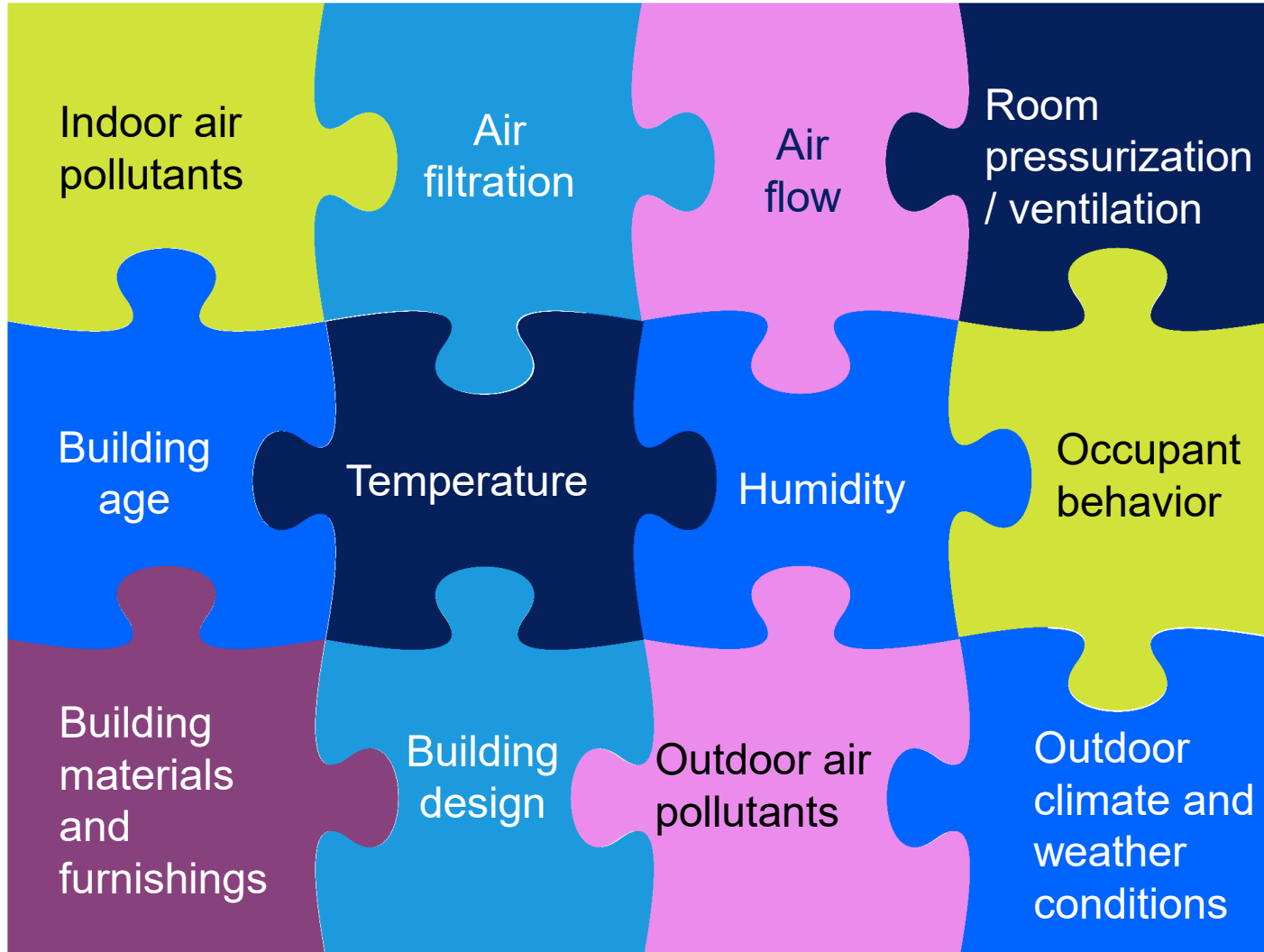
	Name	Index Value	Advisory
	Good	0 to 50	None
	Moderate	51 to 100	Usually sensitive individuals should consider limiting prolonged outdoor exertion.
	Unhealthy for Sensitive Groups	101 to 150	Children, active adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
	Unhealthy	151 to 200	Children, active adults, and people with respiratory disease, such as asthma, should avoid outdoor exertion; everyone else should limit prolonged outdoor exertion.
	Very Unhealthy	201 to 300	Children, active adults, and people with respiratory disease, such as asthma, should avoid outdoor exertion; everyone else should limit outdoor exertion.
	Hazardous	301 to 500	Everyone should avoid all physical activity outdoors.

22,000

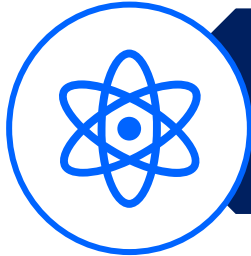
90%

2-5x

What is Indoor Air Quality (IAQ)?



Indoor Air Pollutants



Gas pollutants
(CO, CO₂, NO, Radon)



Biological pollutants
(**mold**, **pests**, pets, bacteria, **viruses**)

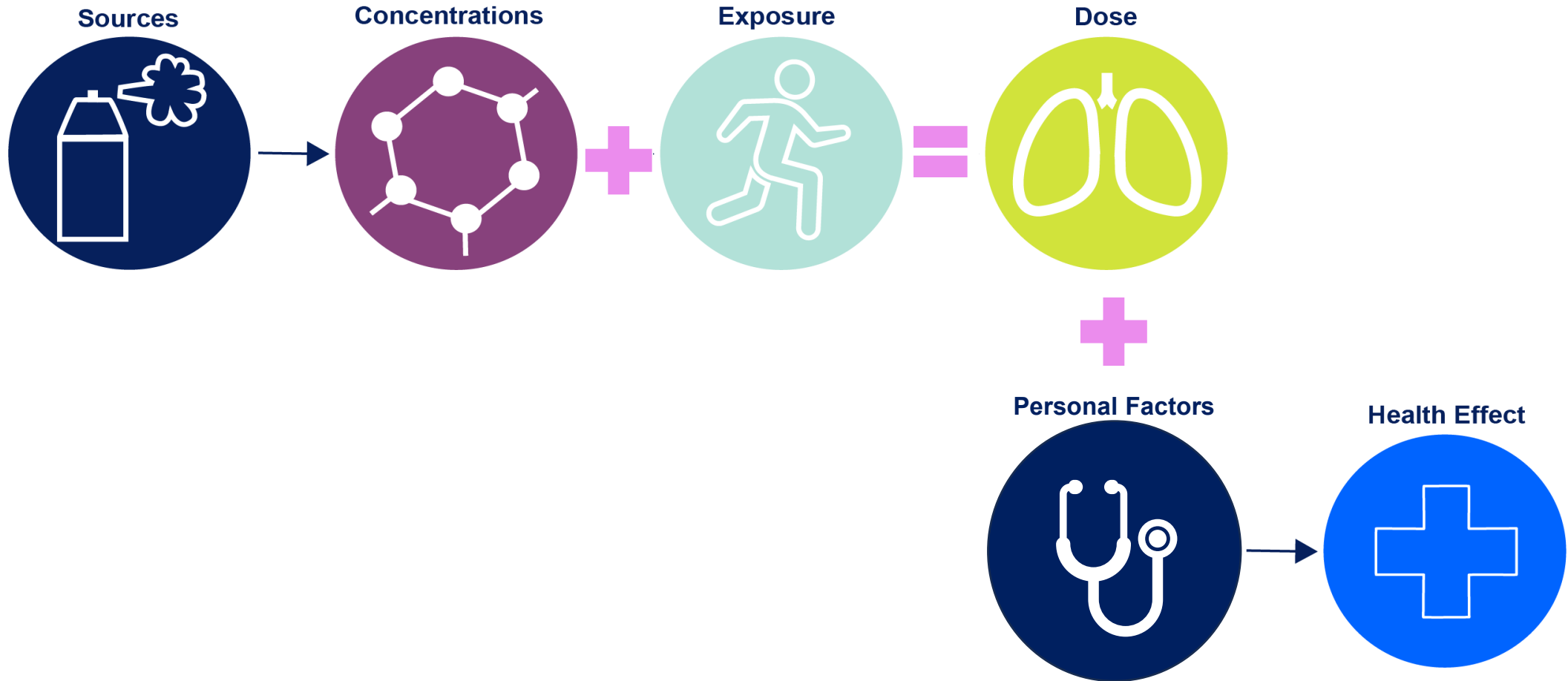


Particulate Matter (PM)
(dust, cooking fumes, smoke, aerosols)

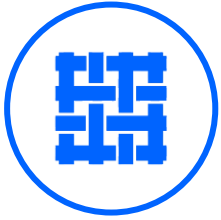


Volatile Organic Compounds (VOC) (chemicals)

It Is All About the Concentration + Exposure = Dose



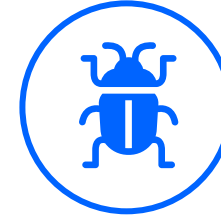
Individual Pollutants Impact on Health



Asbestos
(lung cancer)



Carbon Monoxide
(death, central nervous system damage, lung irritant)



Cockroaches
(**asthma**, allergies, stomach illness, communicable disease)

Pets
(asthma and allergy trigger)

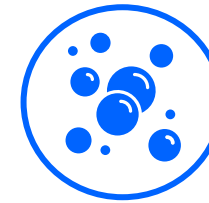
Nitrogen Oxides
(asthma and COPD triggers)



Formaldehyde
(lung irritant, cancer)



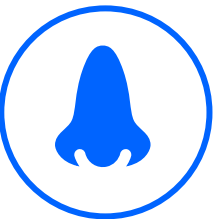
Lead
(nervous system and brain damage, learning and behavioral problems)



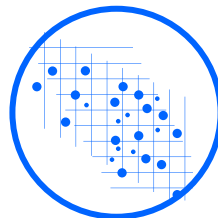
Volatile Organic Compounds (lung irritant, damage to kidney, nervous system, cancer)

Radon
(lung cancer)

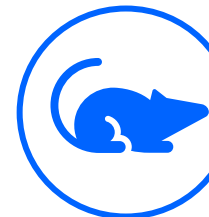
Pesticides
(nervous system)



Mold
(asthma, breathing problems, upper respiratory tract symptoms)



Particulate Matter
(lung irritant, asthma, CVD disease, premature death)



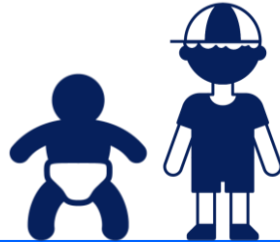
Rodents
(**asthma**, infectious disease)

Vulnerable Populations



Older Adults

- More long-term health conditions
- Defense systems don't work as well
- Less able to combat the effects of pollutants



Children

- Breathe more rapidly, absorb more pollutants
- Live closer to the ground, where pollutant concentrations can be higher



Individuals who are pregnant

- Indoor pollutants, even at low levels, may be associated with adverse birth outcomes



People with pre-existing health conditions

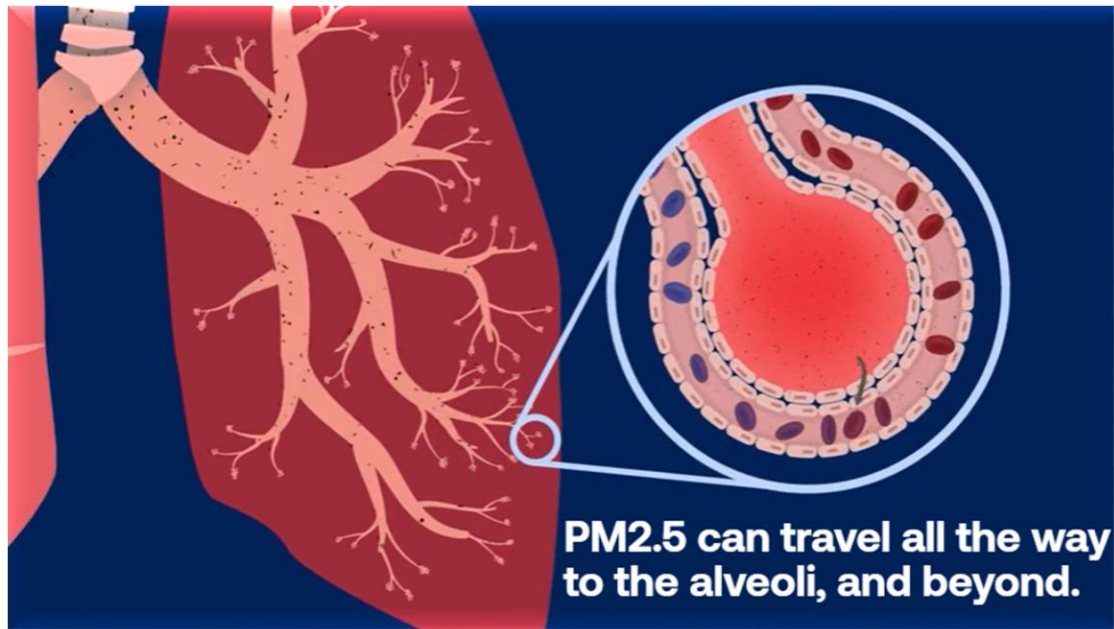
- High risk of exacerbations or complications from their disease

Vulnerable Populations, *cont'd...*

Some communities impacted more by air pollution because they are more likely to:

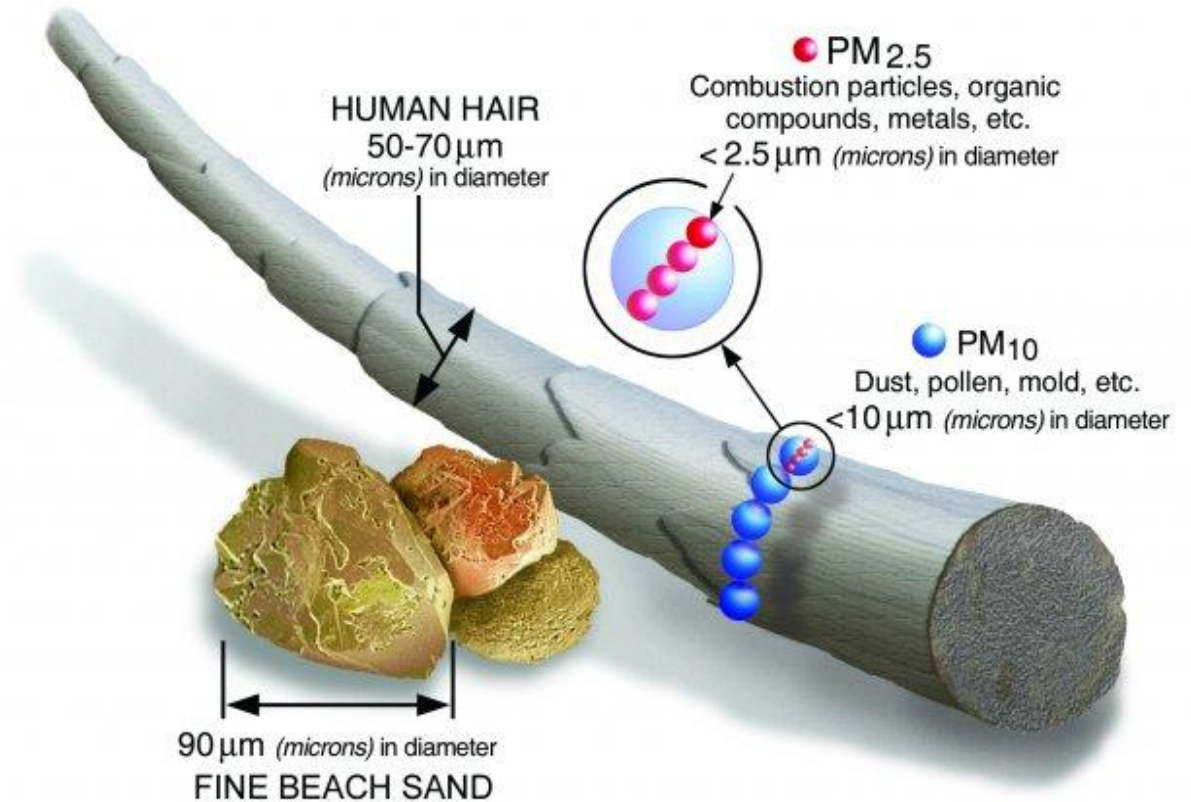
- Live in sub-standard housing
- Live closer to pollution-producing sources
- Have higher risk of chronic disease
- Have more missed days of school and work
- Financial strain of medical costs associated with hospitalizations and ER visits

Particulate Matter and Health Impacts



- Mortality & morbidity
- Heart failure
- Diabetes
- Cerebrovascular disease
- Systemic inflammation

Short-term	Long-term
Coughing	Decreased lung function
Wheezing	Neurological disorders
Shortness of breath	Heart disease
Eye, nose, throat irritation	Stroke
Asthma/COPD worsening	Lung cancer



VOCs and Health Impacts



Long-term:

Some VOCs linked to cancer and can affect the liver, kidney and nervous system



VOCs are known irritants that can affect anyone!



Short-term symptoms:

- Headaches
- Dizziness
- Nausea
- Eye and respiratory irritation
- Goes away when exposure does
- Worsen symptoms for people with **asthma & COPD.**

Mold and Health Impacts



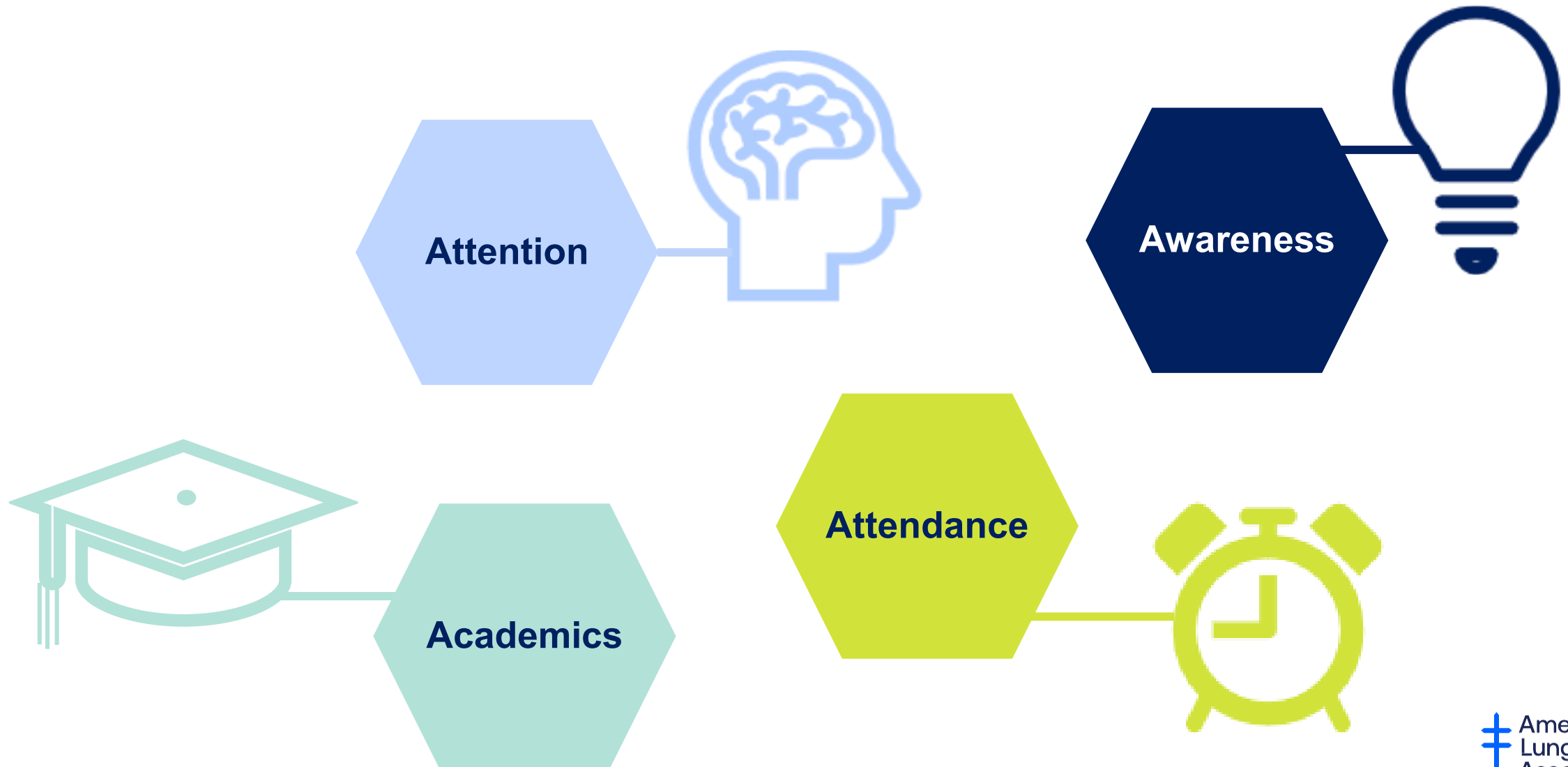
What is Mold?

- Microscopic organism that exists everywhere
- Can be invisible, float in the air, or be inhaled
- Can grow indoors if there's too much moisture
- Can cause significant health problems

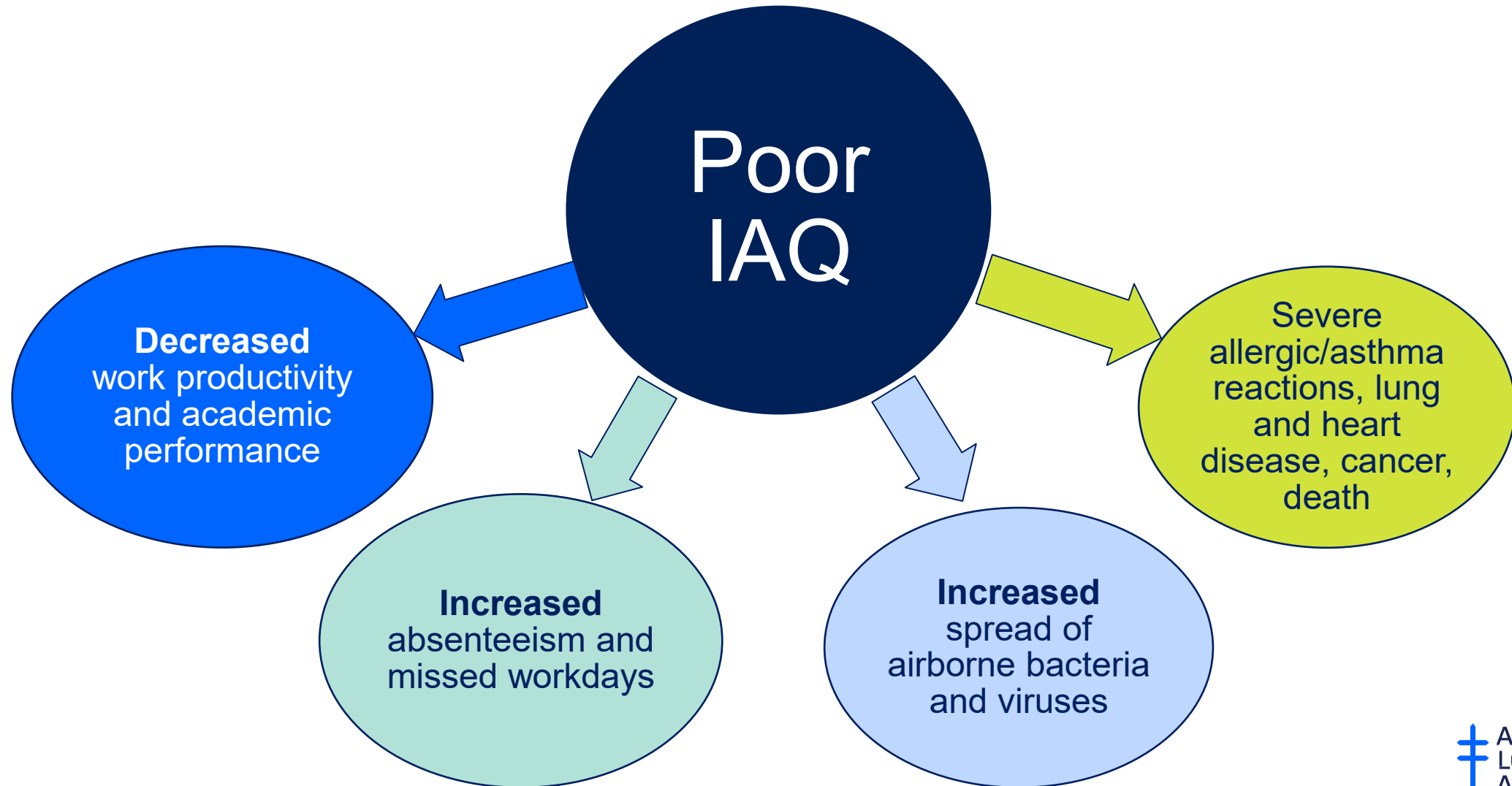
When inhaled, mold exposure can:

- Be perceived as a danger to the immune system
- Cause airway constriction, asthma/allergy symptoms, & other severe reactions

Other IAQ Impacts Important to Schools



Poor Indoor Air Quality Impacts Students and Staff



Schools Face Unique IAQ Challenges

100,000
buildings

49
years

**8:1 child to
adult ratio**

4x
the occupants

- Many pollutant sources
- Multiple processes and chemicals used under one roof
- Tight budgets and history of maintenance deferred too long
 - High poverty districts spend **~37%** less per school on capital investments (like maintenance) than low-poverty districts.
 - **41%** of school districts need to update or replace HVAC in at least half of their schools.
 - **53%** need to update or replace multiple building systems in the school
 - **40%** of public schools do not have a long-term facility plan



Improving Indoor Air Quality: The 3 Step Approach

1. Source Control

Eliminate or reduce the source of pollutant(s)

2. Ventilation

Increase ventilation to dilute pollutant(s)

3. Air Cleaning

Clean the air to capture pollutant(s)

Improving IAQ in Schools

Low-cost solutions

Keep areas near
vents clear

Reduce
clutter

Minimize food
in classrooms

Keep outdoor air
intakes clear of
debris and
obstructions

Turn off computers
and monitors at
end of day.
Unplug appliances
when not in use

Remove plush
furniture, decorative
rugs and
stuffed animals

Remove pets
from classroom

Implement
fragrance-free
policies

Ensure classrooms
are thoroughly dusted
and vacuumed*

Open windows
when possible

Use non-toxic
cleaning supplies

Implement
anti-idling policy

**Use HEPA filter vacuum cleaner*

Improving IAQ in Schools

More cost, yet still relatively simple

Install walk-off mats
at all building
entrances

Install reflective
window coverings

Test for radon
every 5 years and
mitigate if elevated
levels are found

Ensure good
ventilation in spaces
where there are
printers, especially
3D printers

Fans supplying
outdoor air should
operate continuously
during occupied
periods

Fix any water leaks
or sources of water
intrusion.

Assess, maintain,
repair, and update
HVAC systems

Increase efficiency of
HVAC filters to highest
rating possible

Change or clean
HVAC filters at
least every 90 days

Clean Air School Challenge

An engagement, recognition, training and technical assistance program for K-12 schools

Goals

**Develop a written
Energy Efficient IAQ
Management Plan**

Benefits

1. Recognition
2. Education
3. Resources
4. Mini-grant funding
5. Learning cohorts
6. Peer mentoring

How

1. Meet you where you are
2. Structured path and support
3. Templates
4. Technical assistance

Mini-grant Funding

Eligibility

Schools must sign up for Clean Air School Challenge.

Schools must be public or charter K-12.

Priority to low-income, disadvantaged, tribal, and rural communities.

Type	Amount	Examples of Eligible Activities
Assess	\$2,500 per school, and Up to 20 schools in a district	Building walkthrough assessment Determining clean air exchange rates Conducting a staff assessment of IAQ issues Testing for radon, asbestos or mold
Plan	\$3,000 per school, and Up to 20 schools in a district	Staff time to write or update an EEIAQ Staff education around energy management or IAQ Staff training & certification for radon testing and measurement
Act	\$4,000 per school, and Up to 20 schools in a district	Change of all cleaning products to low VOC Change of light bulbs to low energy LED Purchase of HEPA vacuum cleaners Integrated pest management Outdoor “no idling” signs

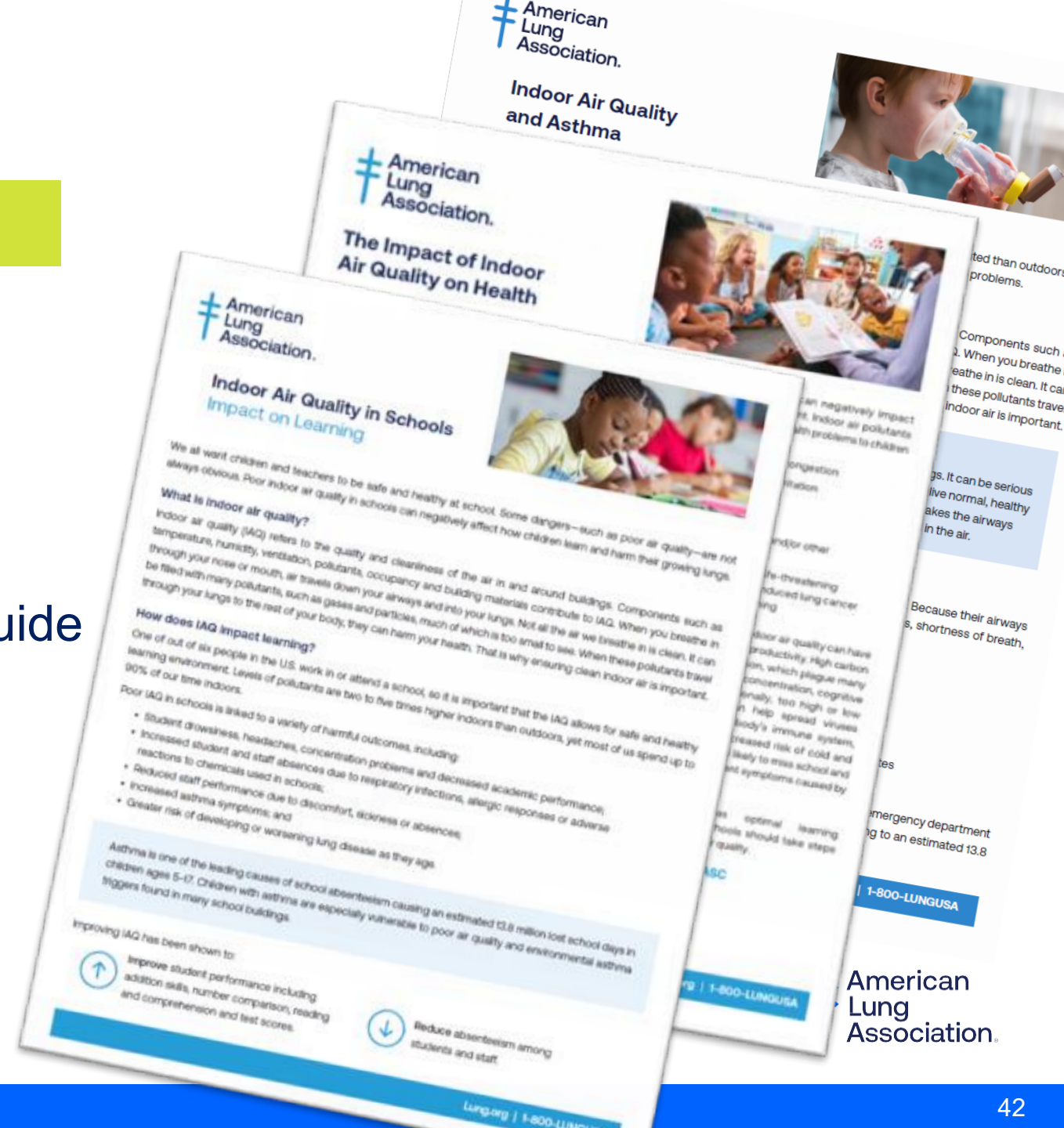
Up to **\$9,500** per school

Up to **\$180,000** per district

Resources – Lung.org

Learn – Lung.org/CASC

- Downloadable fact sheets
- Videos
- Case study
- IAQ in Schools Guide
- Radon Measurement in Schools Guide
- Outreach toolkits Parent
 - Principal
 - School nurse
 - Student
 - Teacher



How to get involved

School Leaders

- Visit Lung.org/CASC to learn more about IAQ what it means to participate in CASC
- Sign-up to participate in CASC and earn recognition at CASCPortal.org
- Share CASC opportunity with other school leaders in your state

School Nurses & Staff, Teachers, Parents and Community Members

- Sign-up to the CASC interest list to stay informed of updates and opportunities
- Use Outreach Toolkits to:
 - share CASC program; encourage your school to sign up
 - educate school leaders in your community on IAQ and energy use

Need help with sign up? Have questions?

Contact Lisa.Gebhard@Lung.org or CASC@Lung.org

IAQ Activities for Kids

Peruse and Use in Your Classroom!

Grades PreK-2

["Catching" Air Pollution](#)

[Where Does the Dust Hide?](#)

[Keep Indoor Air Clean](#)

[Burn, Trash, or Recycle?](#)

[Indoor Air Quality Coloring Sheet](#)

Grades 3-5

[Where Does the Dust Hide?](#)

[How Indoor Air Pollution Happens](#)

[Indoor Air Quality Coloring Sheet](#)

Middle School

[Indoor Air Quality Dilemmas](#)

[Indoor Air Quality Matching Game](#)

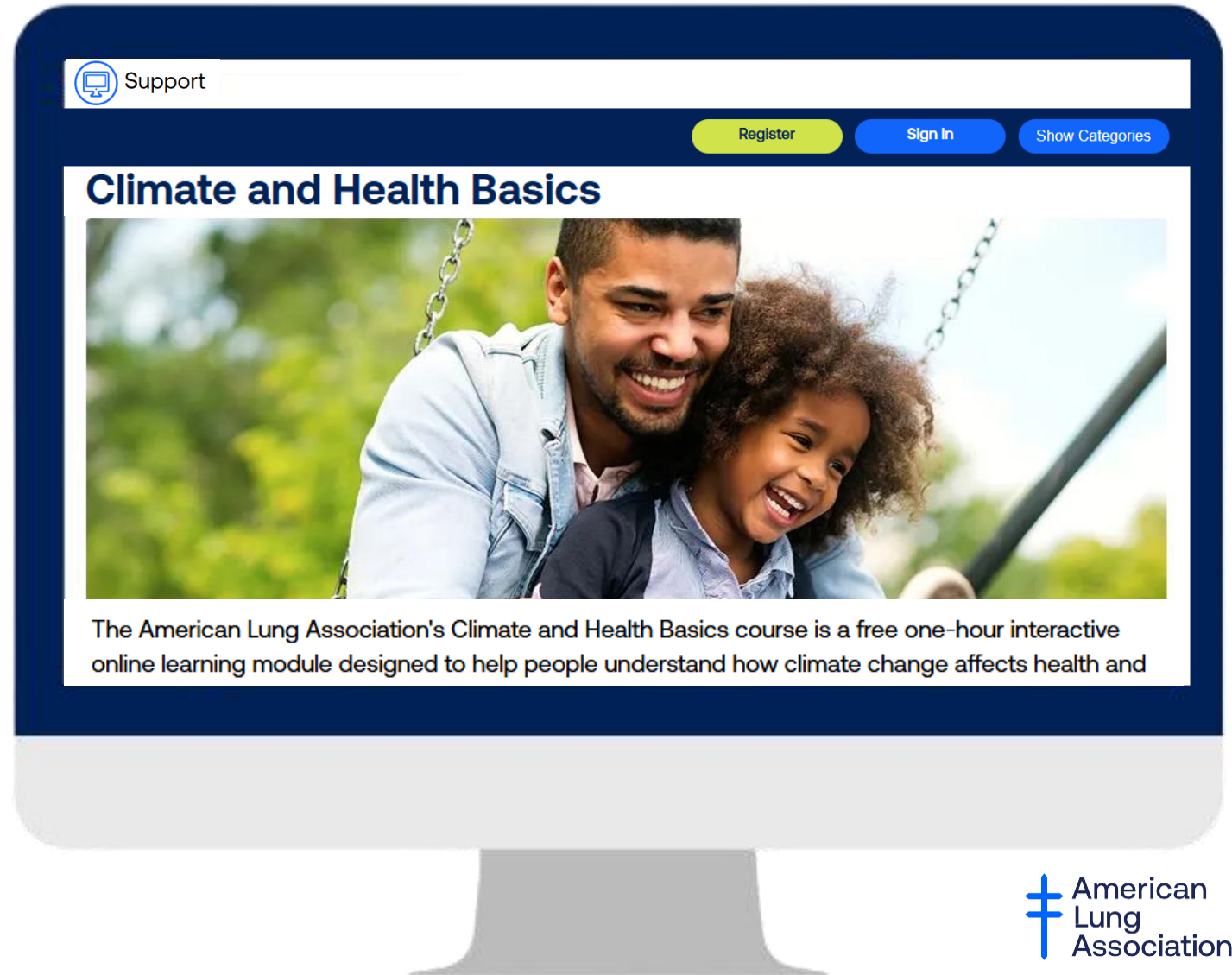
[Indoor Air Quality Word Scramble](#)

[Rubber Band Air Test](#)

Climate and Health Basics

Free one-hour interactive learning module designed to help people understand how climate change affects health and actions that can reduce the risk.

Lung.training



 American Lung Association

Indoor Air at Home

- Indoor air quality at home is also important for students' lung health, especially students with lung conditions such as asthma.
- The Lung Association has information and education courses that can be shared with parents and caregivers.



Four simple tips to keep your home and family healthy



The air you breathe can be harmful to your health. Poor indoor air quality can cause or contribute to the development of lung diseases such as asthma. Let us show you how to protect your family's health with these four easy and important tips for healthy indoor air.

1 Eliminate pests and molds

- Regularly clean tubs, sinks, window seals and other places where mold and mildew grow.
- Remove decaying debris from the roof and gutters.
- Immediately fix water leaks in the house.

2 Reduce dust, dust mites and pet dander

- Vacuum carpets, mop floors, dust furniture and wash bedding once a week.
- Remove shoes and place doormats at your home's entrance to prevent dust and pollen from entering.
- Encase bedding and pillows in dust mite covers.
- Keep pets out of bedrooms, off beds and furniture.

3 Improve household ventilation

- Open windows to let in fresh air.
- Control excess humidity in bathroom by running fans for 30 minutes after bathing.
- Reduce pollutants while cooking by opening a window or running the fan.

4 Keep furnaces, fireplaces and stoves clean

- Have the furnace cleaned, inspected and serviced annually by a licensed heating contractor.
- Change furnace filters every three months and use high quality filters.
- Install carbon monoxide monitors on every level of your home.
- Check fireplaces and wood stoves for proper, efficient operation.

Other tips...

- Quit smoking or vaping, and don't allow others to do so in your home. Refrain from burning candles or incense.
- Use the least toxic cleaning products available. Find safer cleaning recipes at wamhe.org.
- Schedule an annual flu shot because influenza can lead to serious respiratory problems.
- Check your local air quality at AirNow.gov and visit pollen.com for pollen count.

Start here:



Make healthy air in your home your goal!

Our Vision

A World Free of Lung Disease

Lisa.Gebhard@Lung.org

IAQ@Lung.org General IAQ topics and questions

CASC@Lung.org Clean Air School Challenge

What is next?

1. Be sure you have signed in
2. Look for an email from Meagan Budke for materials and slide deck
3. By the end of the week, log in to PD+ to complete the evaluation form and redeem PD hours



When Climate Events Force Us
Indoors



Resources

[ISBE Science Webpage](#)

[N/American Lung Association Webpage](#)

IAQ@Lung.org for General AIQ topics and questions

CASC@Lung.org Clean Air School Challenge

Thank you – Stay Connected

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Lisa Gebhard, American Lung Association, Lisa.Gebhard@Lung.org