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QUALITY EDUCATION

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Asthma in Schools Today

Schools all across the United States share not only an educational mission, but the reality of asthma.

In a classroom of 30 children, two are likely to have asthma[1], which is the leading chronic disease cause of school absenteeism.[2]

Asthma presents a host of issues to entire school populations. It can impact each classroom, students' ability to learn, visits to nurses' offices, teacher productivity, absenteeism, and many others. Schools, however, can help ease asthma's impact by creating an "asthma-friendly" environment, including good indoor air quality (IAQ).

Asthma can be life-threatening if it is not properly managed. The lungs of people with asthma are excessively sensitive to various "triggers" that cause asthma attacks, which result in narrowed airways and other changes, causing difficulty breathing. Asthma never goes away, but it can be controlled. When students' asthma is controlled, it won't interfere with normal daily activities, and asthma attacks are minimized. Everyone with asthma—including those with mild asthma—should avoid their known triggers.

At school, students may be exposed to several triggers on a daily basis. Individuals' triggers can include seasonal and pet allergens, outdoor air pollution, viruses, and indoor air irritants like microscopic particles found in dust, dirt, dust mites, and cockroach antigens. Some triggers like cat dander and other allergens enter the school environment on students and staff who have pets at home.[3]

"Asthma Friendly" School Environments

Avoiding triggers can make a great difference in a child's day-to-day asthma control.

Schools nationwide are becoming more involved in proactively creating asthma-friendly environments to best support students with asthma and minimize asthma's affect on a school's daily rhythms.

Asthma-friendly activities present a holistic approach throughout many elements of school infrastructure and curriculum, including creating a healthy environment.

The National Asthma Education and Prevention Program's *How Asthma-Friendly Is Your School?* assessment includes two environmental questions:

1. Does the school maintain good indoor air quality?
2. Does it reduce or eliminate allergens and irritants that can make asthma worse?[4]

The American Lung Association's

Asthma-Friendly Schools Initiative

provides a wide-range of tested advice for schools to help create "Asthma Friendly Schools."

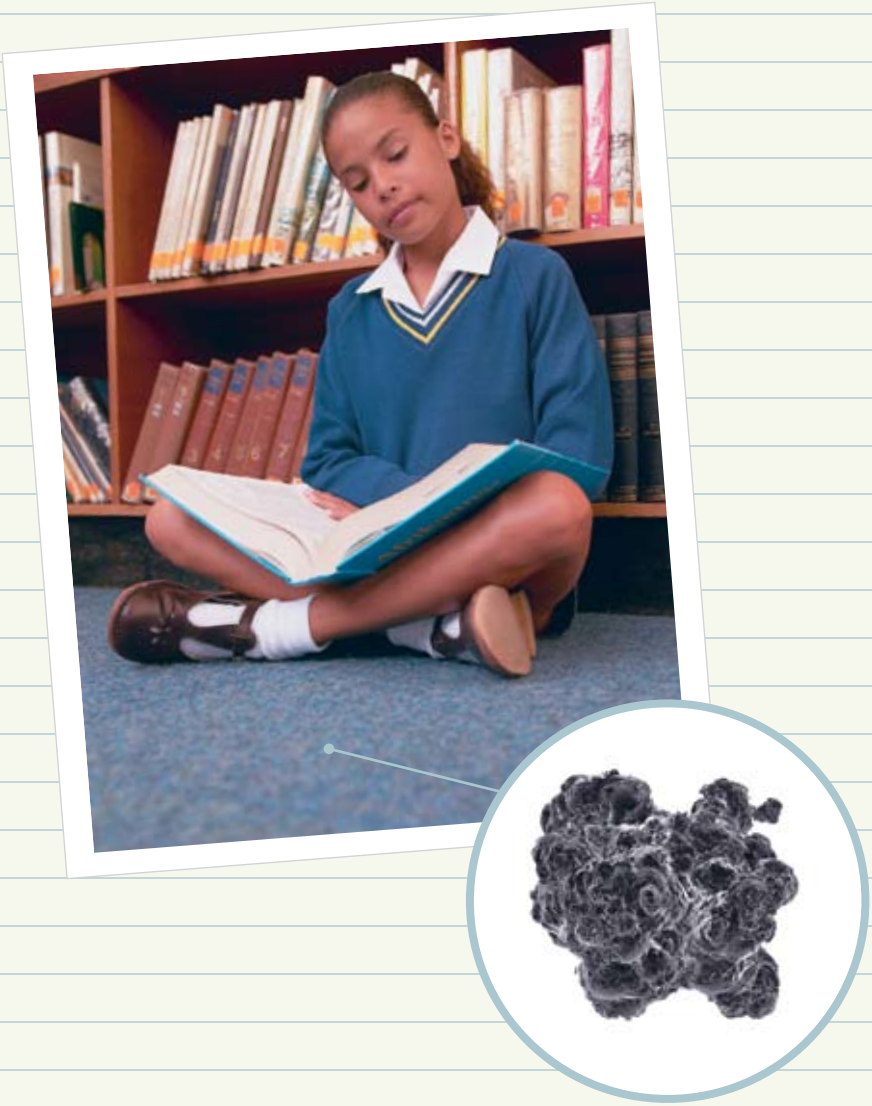
To improve air quality in the school itself, the American Lung Association recommends all schools use the Indoor Air Quality Tools for Schools Kit developed by the U.S. Environmental Protection Agency with the help of the American Lung Association.

The easy-to-use checklists in the Tools for Schools Kit not only help reduce asthma triggers, but improve air quality for all teachers and students alike.

Reducing or eliminating students' exposure to triggers like pet dander, dust mites, and microscopic dust particles is not a simple piece of the environmental puzzle. The most effective way is to keep as many of those sources of pollution outside of the school. Once those allergens and irritants are inside, however, students can benefit from a comprehensive cleaning protocol that incorporates the most effective means of removing them from the environment.

Keeping Asthma Triggers Down:

One simple way to help keep dirt and other particles out of the classroom is to have large entry mats at all entrances that can let children track off much of the soil before they get far into the school.



Finding & Attacking Asthma Triggers: "Clean Vacuuming"

Many allergens and irritants eventually will settle on hard surfaces and carpeting throughout the school. Carpet is a well-known "sink" for dirt, animal dander, pollen, dust mites, and other asthma triggers. These same triggers also can be found on hard flooring, which now comprises about 69 percent of space in new K-12 facilities. [5]

A "clean vacuuming" strategy

can help schools reduce asthma triggers by removing (rather than redistributing) the dust in a building by vacuuming surfaces with an efficiently filtered vacuum cleaner.

Effective vacuuming is not simple—unless the building's staff understand the basics.

Keep these basics in mind:

1. Asthma triggers often come in tiny particles like pollen and pet dander. Many of these particles cannot be seen without a microscope, so **staff cannot use visible dust alone as evidence of whether or not the vacuuming program is effectively capturing asthma triggers.** Some particles settle in carpet and on hard surfaces. The goal is to remove particles from carpet & other surfaces without putting them back into the air.

2. Any movement across flooring—including the movement of a vacuum cleaner—kicks tiny particles into the air. Some of the smallest particles, like cat dander, can spread through a room easily. Be aware that some vacuum cleaners spread these asthma triggers, rather than removing them, because they cannot trap particles.

3. **Vacuum carpets frequently and thoroughly to help limit the allergens and dirt particles indoors.** Always vacuum after all students have left the building. Vacuum or damp mop hard surface floors. Don't dry-mop them, as that spreads dust throughout the air.

High filtration vacuum systems can be effective and can reduce allergens and other triggers. Understanding the elements that can translate into "clean vacuuming" is critical to improving a building's indoor air and creating an asthma-friendly school environment. Choose and use a vacuum system that effectively captures fine particles, including a range of asthma triggers, and minimizes particles being reintroduced into the air.

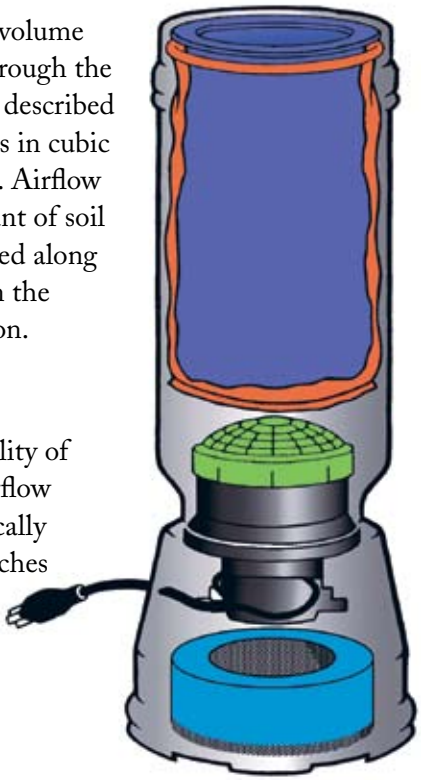
Vacuum Cleaner ABC's

A vacuum cleaner is

a system of four interrelated components that should result in high "particles in-particles out" (particles in: removes the most particles from the surface, particles out: releases the fewest particles back into the indoor environment) efficiency.

1. **Airflow:** volume of air moving through the vacuum (usually described by manufacturers in cubic feet per minute). Airflow affects the amount of soil that can be carried along and contained in the vacuum's filtration.

2. **Lift:** the ability of the vacuum's airflow to lift dirt (typically measured in "inches of lift").



3. **Filtration:** capturing of soils, mainly responsible for reducing "particles out." Filtration must be designed to work with airflow and lift so that the particles are stopped, but not the airflow.

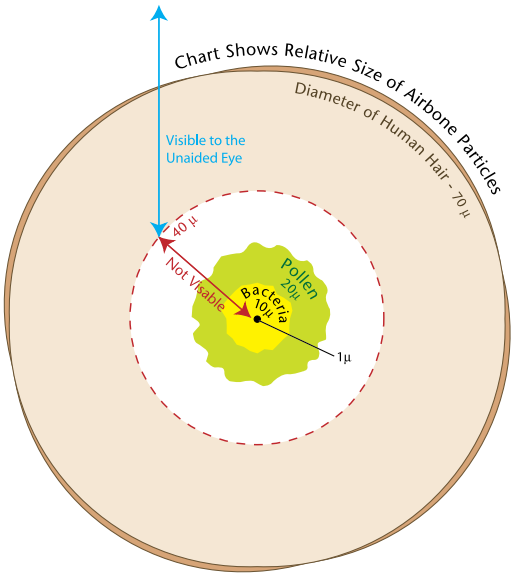
4. **Design:** mechanical elements that can reduce airflow or allow dust to pass by a filter without being caught (for example, gaps in the vacuum body that allow dust to leak out).

To achieve clean vacuuming, a vacuum needs excellent filtration with a properly sized and sealed filter system that uses the appropriate filter media.

Filtration ABC's

A note about filtration systems: Filtration systems involve bags and filters, and commercial vacuum manufacturers typically describe efficiency in percentage of particles removed. Testing and reporting, however, are not standardized, so manufacturers' claims can be tough to compare. Some elements to keep in mind:

Microns: This measurement of particles (1 micron = 1 millionth of a meter) is often used in promoting particle removal. To put things in perspective, your hair is about 70 microns in diameter and, without magnification, you can only see particles that are about 10 microns or larger.



Bags: The amount of dust that can escape varies greatly, even among micro filter bags, but some micro filter bags capture nearly 2400 percent more dust than single-ply bags. Micro filter bags have greater media density that allows them to capture far more fine dust.[6]

Filters: Layered micro filters have been shown to greatly increase vacuum efficiency.[7] "Electrostatic" micro filters use positively-and negatively-charged fibers that capture charged particles in the air passing through the filter. High efficiency particle air (HEPA) filter media have also been shown to be effective at removing allergens and particles indoors.[8]

What Schools Can Do?

A clean vacuuming strategy will help schools minimize or eliminate students exposure to allergens and irritants that are known asthma triggers.

Vacuuming carpets as well as hard floor surfaces frequently and thoroughly with an efficient vacuum system can remove allergens and fine particles from the school environment.

Selecting a vacuum system for clean vacuuming can be complicated.

Comparing various manufacturers' test results, which are not standardized across the vacuum cleaner industry, is like comparing apples to oranges.

Take the time to understand which elements will help you vacuum more cleanly and improve air quality for all students and staff.

When selecting a system:

- Research vacuum systems as much as possible to assess which offer the best quality in terms of airflow and filtration, as well as design best suited to maintenance staff.

- Ask manufacturers questions and request documentation for any health and performance claims.

- Request independent test data regarding filtration, airflow and efficiency. Specifically ask for data to determine the quantity and size of dust particles captured.

- Check references to validate claims.

- Select a unit with high-efficiency filters such as micro filter or HEPA media, good suction, and sealed construction.[9]

The majority of schools include carpeting, and, unfortunately, it would be very difficult to identify a school lacking students with asthma. Schools can take steps to initiate and sustain a "clean vacuuming" system to remove allergens and other asthma triggers from carpet—without redistributing those particles back into the environment.

Sources

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[3] C. Almqyist, M. Wickman et al., Worsening of asthma in children allergic to cats, after indirect exposure to cat at school. American Journal of Respiratory and Critical Care Medicine: 163 (3), March 2001, 694-698.

[4] How Asthma-Friendly Is Your School?. Centers for Disease Control & Prevention, National Asthma Education and Prevention Program. http://www.nhlbi.nih.gov/health/public/lung/asthma/friendly.htm (accessed May 15, 2006)

[5] American School & University's 31st Annual Official Education Construction Report, May 2005.

[6] JW Vaughan, JA Woodfolk, TA Platts-mIlls. Assessment of vacuum cleaners and vacuum cleaner bags recommended for allergic subjects. Journal of Allergy and Clinical Immunology. November 1999. 104(5):914-16.

[7] Ibid.

[8] Popplewell EJ, Innes VA, et al. Pediatr Allergy Immunol. 2000 Aug;11(3):142-8.

[9] Ibid.

ProTeam has partnered with the American Lung Association in a campaign designed to promote awareness and education about indoor air quality issues.

This educational partnership recognizes the American Lung Association's mission of preventing lung disease and promoting lung health as well as ProTeam's goal of developing innovative cleaning technologies to address indoor air quality concerns.

The American Lung Association does not endorse products. For more information from the American Lung Association, call 1-800-LUNG-USA, or visit www.lungusa.com

For more information about ProTeam's complete line of commercial vacuums, call 866.888.2168 or visit www.pro-team.com

The American Lung Association does not endorse products. ProTeam makes a contribution to the American Lung Association to participate in this educational opportunity.

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