

A Breath of Fresh Air

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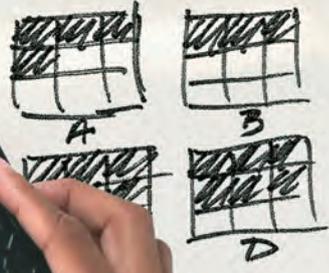
By Rachel Belew

WHEN YOU THINK about a healthy school, what comes to mind? As principal, you might think of an educational environment that offers its students healthy meals, snacks, and drinks; plenty of physical activity in gym class or recess; and a well-rounded, stimulating academic curriculum. But one of the most important aspects of a healthy school—and one that, unfortunately, often falls by the wayside—is indoor air quality.

The U.S. Government Accountability Office estimates that more than 15,000 schools nationwide report suffering from poor indoor air quality. According to the U.S. Environmental Protection Agency, schools with poor indoor air quality experience increased absenteeism, decreased student concentration and productivity, and lower student test scores. Poor indoor air quality is also a known trigger of asthma—a condition that accounts for 14 million missed school days each year, according to the Asthma and Allergy Foundation of America.

“Poor indoor air quality is a serious issue in schools across the country,” says Bill Orr, executive director of the Collaborative for High Performance Schools, a national nonprofit dedicated to making schools a better place to learn. “Unfortunately, it’s not typically high on principals’ list of priorities because it isn’t always easy to gauge. It’s intangible; you can’t see it or touch it. In fact, even the newest, most modern schools must be vigilant in their daily operations and maintenance to ensure good indoor air quality.”

TES	COST
2	\$10
4	\$20



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249	96	?
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1, 2
2, 90
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310.5

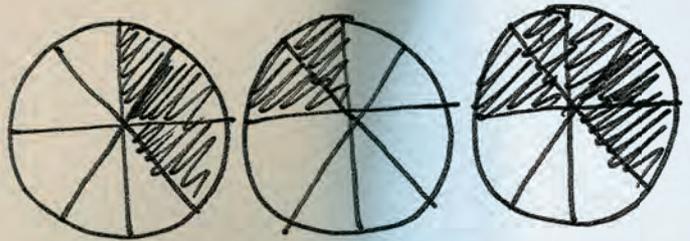


Ⓐ $\frac{3}{5}$

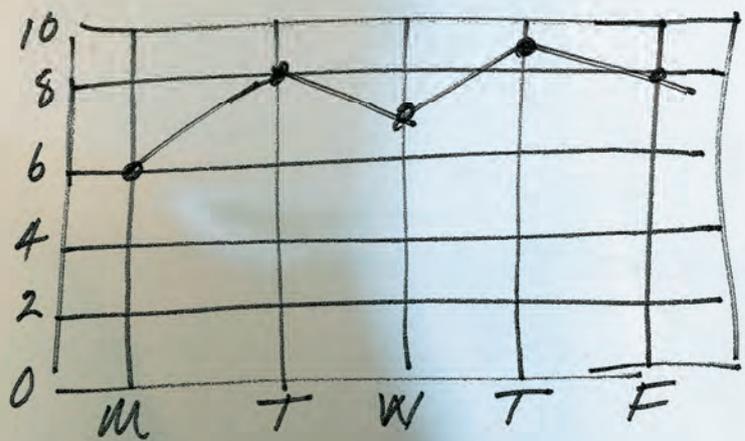


3	5	7	9	
5	9	13		21

- $36\% + 27\% =$
- $439 \div 6 =$
- $1999 + 463 + 275 =$
- $99\% \div 33 =$
- $14\% \text{ of } 6 =$
- $5,032 - 3,659 =$
- $7.03 \times 6.2 =$



$\frac{3}{8} + \frac{2}{8} =$



Causes and Effects

It might come as a surprise, but in addition to the usual suspects—dust, dirt, pollen, and mold spores—one of the biggest sources of indoor air pollution in schools are the very products and materials used to build, furnish, and remodel school interiors. Products such as desks, seating, personal computers, bookshelves, flooring, wallboard, paint, adhesives, and cleaners can each release high concentrations of chemicals known as volatile organic compounds (VOCs) into the indoor air.

Short-term airborne exposure to VOCs can cause burning sensations in the eyes, nose, and throat; coughing; wheezing; headache; nausea and flu-like symptoms; and dizziness. Long-term exposure has been linked to kidney and liver damage, reproductive disorders, developmental disorders, and even cancer. Research also has shown that children who are regularly exposed to VOCs are up to four times more likely to develop asthma.

Children are particularly susceptible to the health impacts of VOC exposure because of their physiology. They breathe more rapidly than adults, inhale a greater volume of air than adults, and metabolize chemicals more quickly than adults. Furthermore, their respiratory, cardiovascular, immune, and neurological systems are immature. These factors amount to what is known as an increased “body burden”

on children: Given the same amount of chemical exposure, the impact on children’s health is greater than the impact on adults’ health.

Of additional concern in schools and other buildings is that multiple VOCs from multiple products can synergize, or combine, creating an airborne “chemical cocktail” to which students, teachers, and staff are repeatedly exposed, says Marilyn Black, an environmental scientist and founder of the Greenguard Environmental Institute.

“Science has shown us the health impacts of certain individual chemicals, such as formaldehyde, which the World Health Organization classifies as a carcinogen,” Black says. “But no one really knows what the effects are from exposure to so many chemicals in one place at one time. We unknowingly inundate ourselves with chemicals in nearly everything we do, every day. Could that be one of the missing links between, say, children and certain learning disabilities? These are the things that parents, doctors, teachers, and school administrators ought to be seriously thinking about.”

Of course, teachers’ health also can be negatively affected by indoor air pollution, leading to teacher absenteeism. When teachers are absent, not only can student learning get interrupted, but also school budgets can break from having to pay additional wages to substitute teachers.

The Gray Area of “Green” Schools

Complicating matters is the widespread push toward tighter, more energy-efficient school buildings. The more tightly sealed and insulated a building is, the less natural airflow there is, which increases the risk of trapping airborne contaminants indoors.

“Many schools have aging, underperforming HVAC systems that don’t adequately ventilate, as well as windows that don’t open. So when school administrators try to ‘green’ their schools by making basic energy-efficiency retrofits—such as adding insulation or sealing walls—they may unintentionally end up enclosing their students

in a bubble of air contaminants,” says Jerry Lamping, director of indoor air quality for the North East Independent School District in San Antonio. “While energy-efficiency retrofits are important, it’s critical that they don’t come at the expense of good indoor air quality. Energy efficiency and indoor air quality are both important and have to work together to ensure that asthma triggers and allergens are at low levels inside the classroom.”

The same holds true for newly constructed, high-performance, “certified green” school buildings, Lamping adds, noting that even modern heating, ventilation, and air conditioning (HVAC) systems can have difficulties with high concentrations of airborne chemicals that can constantly off-gas from furnishings and supplies.

One of the most recidivistic indoor air quality offenders in green schools can be found in the janitor’s closet. Cleaning products used to disinfect and deodorize schools can emit extremely high levels of potentially harmful chemicals. What’s more, studies have shown that these chemicals can remain airborne for some time after the cleaning activity has stopped, potentially putting at risk anyone who enters the room shortly thereafter. Products claiming to be “low-VOC” or “no-VOC” can also be deceptive because these claims tend to refer to the product’s chemical content (rather than its chemical emissions), which is not a reliable indicator of the product’s impact on indoor air quality.

Guiding Principles for School Principals

The good news is that poor indoor air quality in schools can be mitigated by following a few guiding principles. The first is called source control, which means exactly what it sounds like: controlling the source of the pollution so the pollutants don’t enter the school in the first place. Ideally, source control entails furnishing and maintaining schools with products and materials that don’t contribute to indoor air pollution. These are products that have been scientifically tested independently of

Principal ONLINE

Access the following web resources by visiting *Principal* magazine online: www.naesp.org/SeptOct11

➔ Peruse an **online database of low-emitting products** on the Greenguard Environmental Institute website, which also answers frequently asked questions about indoor air quality.

➔ The *Principal* magazine article **“Curbing Chronic Absence in the Early Grades”** addresses how principals can ensure all their students are attending school regularly.

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manufacturers or industry groups and, ultimately, proved to be low-emitting.

The Greenguard Environmental Institute is one of the most well-known and reputable third-party product certifiers in North America. The institute's mission is to protect public health by enhancing indoor air quality and reducing chemical exposure. As such, it oversees a rigorous, science-based certification program that requires independent laboratory testing of product emissions and screens for more than 10,000 chemicals. Products intended for use in schools that meet the institute's stringent chemical emissions requirements can achieve the Greenguard Children & Schools Certification and bear its certified mark, which identifies them as healthier products for school environments.

"We wanted to create a marketplace tool to help school principals, facility supervisors, and other purchasers discern which products out there are bona fide low-emitting," Black says. "The Greenguard Children & Schools Certified mark is all they have to look for to know that the product meets some of the world's toughest chemical emissions standards." More than 10,000 products across nearly two dozen industries have achieved this certification, everything from paints and adhesives to classroom desks and seating.

In addition to practicing source control, principals should follow these guiding principles to ensure optimal indoor air quality in their schools:

Institute a regular green cleaning maintenance and training program. The program should define specific

green cleaning processes—not only for janitors, but also for teachers, staff, and administrators—and should focus first and foremost on protecting health. Be sure to document each time the program is carried out so you can keep track of your progress.

Require that walk-off mats be installed in front of every school entrance. Mats trap up to 80 percent of tracked-in soil that would otherwise become indoor particulate pollution. Mats should allow room for at least six footsteps (16 to 18 feet).

Advise janitorial staff and teachers to avoid cleaning products with added fragrances, as these scents are made from chemicals. When and if chemical cleaning products must be used, make sure they know to use the least amount possible.

Reserve cleaning activities for after-school hours when the building is unoccupied, only. Be sure that janitorial staff keep all interior doors open after cleaning to promote airflow.

Avoid running the air conditioning system while the windows are open, as this can lead to moisture build-up and subsequent mold growth.

Instruct teachers to avoid blocking the air returns in their classrooms with furniture or supplies. Air returns remove polluted air from the room by exhausting and reconditioning it.

Instruct your facility manager to install the highest rated MERV (Minimum Efficiency Reporting Value) air filter for your school's HVAC system and replace it on a quarterly basis. The higher the MERV rating, the more airborne particles the filter will trap.

Have your facility manager make sure that all outdoor air intakes are located away from potential pollution sources such as idling vehicles or smoking areas. This will ensure that the outdoor air entering the school does not usher in any additional pollutants.

Instruct your facility manager to keep relative humidity in the school below 65 percent at all times to avoid moisture-related problems.

Consider TAB (testing and balancing) commissioning for your new or renovated school to ensure that the high-performance HVAC system is working as designed to ensure the highest quality indoor air.

Breathe Your Way to a Healthier School

No other feature of a school single-handedly touches so many critical issues as indoor air quality does. Indeed, academic performance, attendance, concentration, and overall well-being depend heavily on the healthfulness of the air that students and teachers breathe.

"The best textbooks and computer software in the world won't impact achievement if teachers and students are absent from school," says Angela Pringle, principal of Arabia Mountain High School in DeKalb County, Georgia, the state's first public school to achieve LEED Silver, a level of green building certification. "One of the five priorities in our teacher success plan has been attention to indoor air quality. It really affects everything."

And that's why it's so important for principals to make indoor air quality a priority, notes Jim McGrath, executive director of the National Green Schools Network. "Schools cannot be 'green' and healthy without the full commitment of principals," he says. "The leadership at the building level is the most essential component of a green and healthy school movement across America." ■

Rachel Belew is the public relations and communications manager for the Greenguard Environmental Institute.