

# Voluntary Guidelines for States Development and Implementation of a School Environmental Health Program



## Acknowledgments

The U.S. Environmental Protection Agency (EPA), Office of Children's Health Protection wishes to acknowledge those who were instrumental in the development of these voluntary guidelines for states on developing and implementing a school environmental health program. Particular recognition goes to the Federal Steering Committee (the Department of Education, the Centers for Disease Control and Prevention, the Agency for Toxic Substances and Disease Registry, the Department of Agriculture, the Department of Defense, the Bureau of Indian Education, and the White House Council on Environmental Quality), established as directed by the Energy Independence and Security Act, and EPA's Program and Regional Offices for their direction, expertise, and support. Sincere appreciation also goes to the states of Colorado, Connecticut, Kentucky, Minnesota, New Hampshire, Rhode Island, Washington, and Wisconsin for providing insight and perspective on their existing school-related environmental health programs, as well as their permission to include case studies that highlight their programs in the guidelines.

Most importantly, EPA would like to acknowledge the stakeholders, state officials, school officials and staff, parents, and interest groups for their continued interest and invaluable input to EPA throughout the process of developing these voluntary guidelines.



# Acronyms and Abbreviations

<b>AGC</b>	Academy for Global Citizenship	<b>NGO</b>	Non-governmental organization
<b>CCHS</b>	Colorado Coalition for Healthy Schools	<b>NIOSH</b>	National Institute for Occupational Safety and Health
<b>CDC</b>	Centers for Disease Control and Prevention	<b>PCB</b>	Polychlorinated Biphenyl
<b>CHPS</b>	Collaborative for High Performance Schools	<b>PEHSU</b>	Pediatric Environmental Health Specialty Unit
<b>CSIERT</b>	Connecticut School Indoor Environment Resource Team	<b>PWS</b>	Public water system
<b>EPA</b>	Environmental Protection Agency	<b>RIDE</b>	Rhode Island Department of Elementary and Secondary Education
<b>GEF</b>	Green Education Foundation	<b>RRP Rule</b>	Renovation, Repair and Painting Rule
<b>HAP</b>	Hazardous air pollutant	<b>SAVES</b>	School Advanced Ventilation Engineering Software
<b>HAZMAT</b>	Hazardous material	<b>SchEH&amp;S</b>	(Washington) School Environmental Health and Safety Program
<b>HealthySEAT</b>	Healthy Schools Environments Assessment Tool	<b>SDS</b>	Safety Data Sheets
<b>HVAC</b>	Heating, ventilation, and air conditioning	<b>SMP</b>	Sustainability management plan
<b>IAQ</b>	Indoor air quality	<b>TEAMS</b>	(Carrollton-Farmer's Branch Independent School District, Texas) Tools for Schools, Energy, Asbestos, Moisture Management, Safety and Security
<b>IgCC</b>	International Green Construction Code	<b>TIMES</b>	(Carrollton-Farmer's Branch Independent School District, Texas) Tools for Schools, Integrated Pest Management, Moisture Management, Energy, Safety and Security
<b>IPM</b>	Integrated pest management	<b>VOC</b>	Volatile organic compound
<b>KEEPS</b>	Kentucky Energy Efficiency Program for Schools		
<b>KGHS</b>	Kentucky Green and Healthy Schools		
<b>LEED</b>	Leadership in Energy and Environmental Design		
<b>LHJ</b>	Local health jurisdiction		
<b>MCCSC</b>	Monroe County Community School Corporation		
<b>NEED</b>	National Energy Education Development project		

# Executive Summary

The U.S. Environmental Protection Agency (EPA) has developed these voluntary guidelines<sup>a</sup> to assist states in establishing and implementing environmental health programs for K-12 schools in accordance with the [Energy Independence & Security Act of 2007](#). In carrying out this statutory mandate, EPA, along with its federal partners, developed these guidelines to help states<sup>b</sup> establish the infrastructure needed to support schools in implementing school environmental health programs. The practices recommended within these guidelines can also be applied, with appropriate adaptation, to a wide range of school-related institutions, including child care and early learning centers.

Protecting children's health and advancing environmental justice are critically important goals for EPA, as reflected in EPA's strategic plan.<sup>1</sup> A child's developing organ systems are often highly sensitive to environmental stressors, and children are frequently more heavily exposed to toxic substances in the environment than are adults.<sup>2</sup> Children in minority, low-income, and other underserved populations, as well as children with disabilities, can experience higher exposures to multiple environmental contaminants where they live, learn, and play and might be placed at a disproportionate risk for associated health effects.<sup>3</sup>

School environments play an important role in the health and academic success of children. Children spend 90% of their time indoors and much of that time is spent in school. Unhealthy school environments can affect children's health, attendance, concentration, and performance, as well as lead to expensive, time-consuming cleanup and remediation activities.<sup>4</sup> To foster children's health and academic achievement, healthy school environments must be addressed and integrated within the education system.

States can play a critical leadership role in promoting healthy school environments for children. These guidelines build on the foundation established by well-documented strategies and existing federal programs, such as EPA's Indoor Air Quality (IAQ) Tools for Schools program and the Centers for Disease Control and Prevention's Coordinated School Health strategy, and provide examples of best practices from existing state environmental health programs for schools. These voluntary guidelines recommend five basic elements and six steps that states can take to build or enhance a sustainable state environmental health program for schools.

To complement the guidelines, EPA has developed a [model K-12 school environmental health program](#) as a resource that states can customize and share with schools and school districts to help them establish or enhance their individual school environmental health programs. The model program, included as [Appendix A](#) to this document, reflects and builds on EPA's Indoor Air Quality (IAQ) Tools for Schools program framework and identifies five broad components of environmental health issues that schools need to address to ensure

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a Throughout this document, these voluntary guidelines are referred to as "the guidelines."

b Throughout this document, the term "states" refers to states and territories of the United States.

## Six Recommended Steps that States Can Take to Build or Enhance a Sustainable State Environmental Health Program for Schools

STEP 1	<b>Assess Existing Resources and Infrastructure</b> Identify a lead office within a state agency that can work with other agencies and assess existing state initiatives and any existing laws, policies, or regulations that address healthy school environments.
STEP 2	<b>Determine Capacity</b> Determine the capacity of each state agency to contribute to an effective state environmental health program for schools.
STEP 3	<b>Develop a Plan</b> Develop an initial plan to establish a new, or enhance an existing, state environmental health program for schools based on available resources.
STEP 4	<b>Implement the Program</b> Work with the lead office or steering committee to ensure the state program is implemented effectively.
STEP 5	<b>Evaluate the Program</b> Evaluate the state program's goals, activities, and milestones to determine whether they need to be revised or expanded to improve the program.
STEP 6	<b>Sustain the Program</b> Utilize the results of state program evaluations to determine the return on investment, make adjustments to the program where needed, and communicate successes.

healthy school environments for children and staff. The components are presented in a tiered approach that recommends actions for schools that do not have an environmental health program, as well as actions schools can take to enhance an existing program. The steps outlined in the model program are consistent with many of the priority actions identified as criteria for the [U.S. Department of Education Green Ribbon Schools](#) recognition award.

Three additional appendices contain information and resources that complement these guidelines and the model program. [Appendix B](#) presents case studies that highlight states with effective school environmental health programs, including best practices and lessons learned. [Appendix C](#) contains a comprehensive listing of websites, tools, and resources that states, schools, and school districts can consult when developing and implementing state and local school environmental health programs. [Appendix D](#) contains a list of frequently asked questions that address issues such as the purpose, content, audience, and scope of the guidelines.

These guidelines are voluntary and are not intended to replace, amend, or negate policies, statutes, regulations, activities, or guidance related to existing school environmental health programs. By following the recommendations in these guidelines, states can help promote safe and healthy school environments for children and school staff.

## Endnotes

1. U.S. Environmental Protection Agency. (2010). *EPA strategic plan*. Retrieved 2012, from U.S. Environmental Protection Agency: [www.epa.gov/planandbudget/strategicplan.html](http://www.epa.gov/planandbudget/strategicplan.html).
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# About the Guidelines

## EPA's Role in Promoting K-12 School Environmental Health Programs for States

The [Energy Independence and Security Act of 2007](#) amended the Toxic Substances Control Act, 15 U.S.C. 2601 et seq., by adding a requirement for the U.S. Environmental Protection Agency (EPA), in consultation with relevant federal agencies, to develop voluntary guidelines to assist states in establishing and implementing environmental health programs for K-12 schools. Healthy school environments play an important role in the health and academic success of children. Exposure to environmental hazards in schools can negatively impact the health of children and school staff.<sup>1</sup> Unhealthy school environments can also affect attendance, concentration, and performance, as well as lead to expensive, time-consuming cleanup and remediation activities.<sup>1</sup>

Protecting children's health and advancing environmental justice are critically important goals for EPA, as reflected in EPA's strategic plan.<sup>2</sup> A child's developing organ systems are often more sensitive to environmental stressors, and children are frequently more heavily exposed to toxic substances in the environment than are adults.<sup>3</sup> Children in minority, low-income, and other underserved populations, as well as children with disabilities, can experience higher exposures to multiple environmental contaminants where they live, learn, and play and might be placed at a disproportionate risk for associated health effects.<sup>4</sup>

EPA has a host of programs and an extensive list of resources to help states assist schools and school districts in

creating comprehensive, sustainable strategies that promote healthy learning places for students. EPA's [Indoor Air Quality \(IAQ\) Tools for Schools Program](#), [ENERGY STAR for K-12 School Districts](#), [Integrated Pest Management \(IPM\) for Schools](#), [School Flag Program](#), and [SunWise](#) are just some of the EPA programs and resources that are included in these guidelines.

### What is an Effective State Environmental Health Program for Schools?

An effective state environmental health program for schools is a holistic, comprehensive, and actionable strategy that integrates preventive measures and addresses environmental health issues by fostering well-maintained school buildings and grounds. Sustainable school environmental health programs promote school environments that are conducive to learning and protect the health of children and staff. These programs have the added benefits of reducing school absenteeism, enhancing student performance, and ultimately, saving money for schools and school districts.<sup>5</sup> Existing, successful school environmental health programs have been strongly supported and sustained through the development and implementation of state policies and regulations that promote awareness and participation by teachers, school staff, and students.

These guidelines are designed to help states address environmental health challenges in K-12 schools by:

- Outlining steps that states can take to establish, promote, and sustain successful and affordable school environmental health programs.
- Assisting states in providing schools and school districts with technical tools and resources, including a comprehensive [model school environmental health program](#), to help schools implement practical, cost-effective environmental health solutions.
- Sharing best practices and highlighting case studies of successful, cost-effective state environmental health programs for schools that can be implemented by other states.

## The Importance of Environmental Health in K-12 Schools

On any given day in America, more than 50 million public school students spend a significant portion of their day in school buildings.<sup>6</sup> When the school environment is unhealthy, children can be exposed to allergens, pollutants, chemicals, and classroom conditions (e.g., poor ventilation, lighting, acoustics, and temperature control) that might cause their health, attendance, and academic performance to suffer.<sup>c,7</sup> In

### Examples of Symptoms Caused by Poor Indoor Environmental Health:<sup>1</sup>

- ★ Respiratory irritation
- ★ Sore throats
- ★ Drowsiness
- ★ Headaches
- ★ Asthma attacks
- ★ Inability to concentrate

a 2005 survey conducted by the National Center for Educational Statistics, 43% of public school principals reported that a variety of environmental factors (e.g., indoor air quality, ventilation, and day lighting) interfered with the delivery of instruction in permanent school buildings.<sup>8</sup> Furthermore, a 2011 report issued by the Institute of Medicine suggests climate change might worsen existing indoor environmental problems and introduce new ones.<sup>9</sup>



### Vulnerability of Children to Contaminants in Their Environment

Children are often more heavily exposed to toxic substances in the environment than adults because they spend more time on the ground and engage in more hand-to-mouth behavior. Children also breathe more air, drink more water, and eat more food per pound of body weight than adults.<sup>3</sup> A child's respiratory, immune, nervous, reproductive, and skeletal systems continue to develop throughout childhood. Exposures to environmental contaminants that occur early in life can cause adverse health impacts in children that can have implications well into adulthood.<sup>10</sup> Furthermore, some children with disabilities face unique challenges that might make them particularly vulnerable to the effects of an unhealthy school environment.

When addressing children's environmental health in schools, it is important to note that poor indoor environments can affect a child's health. Dirt, allergens, chemicals, and other contaminants can trigger or further aggravate allergies and illnesses, such as asthma. Asthma is a great health concern for children, and is the leading cause of

<sup>c</sup> The book *Safe and Healthy School Environments* explores the school environment using the methods and perspectives of environmental health science. Though environmental health has long been understood to be an important factor in workplaces, homes, and communities, this book addresses the same basic concerns in schools.

## Environmental Justice and Children’s Health in Schools

When addressing children’s environmental health in schools, it is important to note that significant disparities exist in the prevalence of chronic health outcomes in children.<sup>3,11</sup> For example, although the prevalence of asthma in American children has been reported to be slightly less than 10% as a whole, in 2009, the prevalence of asthma among African-American children living below the poverty line was approximately 18%, or twice the national average.<sup>11</sup> Numerous asthma triggers can be present in school environments, ranging from mold to constituents in cleaning products and pesticides. A variety of chronic health outcomes are of potential concern among children in schools and these issues can result in disparate impacts in a broad diversity of populations, including children with disabilities.

Healthy school environments are a key step in reducing asthma disparities. The [Coordinated Federal Action Plan to Reduce Racial and Ethnic Asthma Disparities](#), released in May 2012 by the President’s Task Force on Environmental Health Risks and Safety Risks to Children, promotes reducing the burden caused by asthma on children in minority and low-income communities, including reducing exposures to asthma triggers in the school environment.

In addition, the quality of the school environment is often tied to income. Per capita school expenditures can vary greatly according to community resources, especially because many school districts rely on local property taxes for funding.<sup>12</sup> In 1999, a federal survey of school facilities in a representative sample of 903 public elementary and secondary schools<sup>13</sup> found that 20% of schools had a building in less than adequate repair, 43% had at least one infrastructure deficiency (e.g., heating, indoor air quality), and approximately 10% were seriously overcrowded (greater than 125% capacity). Not surprisingly, predominantly low-income schools suffered a disproportionate burden of inadequate school facilities.<sup>12</sup>

children’s absence from school.<sup>14</sup> Children who have uncontrolled asthma have more disturbed sleep, have been shown to perform worse on concentration and memory tests, and tend to have more psychological problems.<sup>15</sup> Asthma can have significant impacts on a variety of children’s health outcomes and classroom performance.<sup>16</sup>

### Impact on Student Performance

Poor indoor environments have been associated with a variety of health symptoms and a decline in student performance in reasoning, typing, and math.<sup>17</sup> Several studies have found that health, attendance, and academic

performance improve with increased maintenance of school facilities.<sup>16,18</sup> For instance, one study found that schools in better physical condition report improved academic performance while schools with fewer janitorial personnel and higher maintenance backlogs report poorer academic performance.<sup>19</sup> Other studies demonstrate that improved indoor air quality increases productivity and performance of mental tasks (e.g., concentration and recall) in both adults and children.<sup>d,7</sup> Growing evidence also suggests that improving outdoor air ventilation rates can improve student and teacher performance, increase test scores,

and reduce airborne transmission of infection.<sup>20,21,22,23,24</sup> In one study, children in classrooms with higher outdoor air ventilation rates scored 14 to 15% higher on standardized tests than children in classrooms with lower outdoor air ventilation rates.<sup>25</sup>

A state environmental health program for schools can play a critical role in setting the expectation for schools to provide an environment that protects children's health and maximizes student performance.

### School Legal Requirements

Although these guidelines are voluntary, it is important to note that schools are obligated to comply with relevant environmental regulations, and environmental compliance is an integral part of a state environmental health program for schools. EPA Region 2's [Environmental Compliance and Best Management Practices: Guidance Manual for K-12 Schools](#) serves as a helpful reminder of key environmental requirements. It is important to note that this document does not address state or local requirements that could apply and, in some cases, be more stringent. Other organizations that provide resources to help K-12 schools with compliance include the National Institute for Occupational Safety and Health's [Safety Checklist for Schools](#) and the Environmental Law Institute's [Indoor Environments and Green Buildings Policy Resource Center](#).

Additionally, the Individuals with Disabilities Education Act of 1997 and section 504 of the Rehabilitation Act of 1973, [Subpart D](#), require public elementary and secondary school recipients of federal funding to provide an appropriate public education

d For a summary of the impact of indoor environmental quality on work and school performance, as well as other indoor air quality research findings, see the Indoor Air Quality (IAQ) Scientific Findings Resource Bank established as a cooperative venture between EPA and the Lawrence Berkeley National Laboratory: Accessible at <http://www.iaqscience.lbl.gov/performance-summary.html>.

## SNAPSHOT: School Buildings and Student Performance

A 2008 study of 95 New York City public schools found that students attended fewer days on average and had lower grades in English, language arts, and math when enrolled in school facilities that were in poor condition.<sup>26</sup>

to qualified students with disabilities, which include those with respiratory physical impairments. The provisions of an appropriate education must be designed to meet the individual educational needs of disabled persons as adequately as the needs of nondisabled persons. Properly addressing indoor environmental quality can help schools adhere to the Individuals with Disabilities Education Act and improve student and staff performance.



### Costs and Benefits of a State Environmental Health Program for Schools

Although schools and school districts face many financial challenges, modest investments in improving school environments and implementing practical preventive strategies can yield significant benefits and cost savings. Benefits of state environmental health programs for schools can be seen in decreased absenteeism among children and teachers,<sup>7,27</sup> stronger academic performance,<sup>9,28,29</sup> and higher scores on standardized tests.<sup>30</sup> Small investments to address critical environmental issues in schools can save schools money by avoiding costly cleanups and remediation related to

poor indoor air quality, mold and mildew damage, mismanaged chemicals, and pest infestation. By implementing school environmental health programs, states can help schools significantly improve their environments, where children spend more time than any other place outside of their homes.

There are measurable costs for not promoting healthy school environments. The costs imposed by environmentally attributable diseases, such as asthma, on children, families, and schools are immense.<sup>31</sup> According to the Centers for Disease Control and Prevention (CDC), the annual economic cost of asthma, including direct medical costs from hospital stays and indirect costs (e.g., lost school and work days), amounts to more than \$56 billion annually.<sup>33</sup> For states, a large percentage of these costs can be attributed to health care expenditures, lost school days, and lost productivity (e.g., parents having to stay home to care for a sick child). Given the amount of time that children spend in school every day, high-quality school environments are critically important for ensuring that children are healthy and able to perform in the classroom.

It is also important to focus on healthy school environments when conducting other upgrades to schools, such as energy efficiency improvements (e.g., changes to the building envelope, ventilation systems, lighting, and climate control). When done properly, many energy efficiency upgrades can yield significant cost savings and environmental benefits, and can also help improve the quality of a school's indoor environment, protecting, and even enhancing, indoor air quality without sacrificing energy performance. If certain energy upgrades are not done correctly, however, they might adversely impact indoor air quality and cause other health concerns for children and staff. For example, increased energy efficiency in building construction, in some cases, has resulted in tighter building shells and reduced ventilation rates. EPA's [Energy Efficiency and Indoor Air Quality in Schools](#) working paper describes how to enhance energy efficiency while protecting indoor air quality. For additional guidance on indoor air quality, consult EPA's [IAQ Tools for Schools Action Kit](#).



# The Role of States in Fostering Environmental Health Programs in K-12 Schools

States can play a variety of critical roles in promoting and ensuring that schools implement effective, comprehensive, and sustainable environmental health programs. For example, state agencies have participated in the development and implementation of policies and regulations for schools that encourage adoption of environmental health best practices and ensure healthier, productive environments for children and staff. Successful implementation of these best practices for healthy school environments can help reduce children and staff absenteeism, improve student performance, and prevent unnecessary costs associated with unhealthy school environments.<sup>5</sup>

These voluntary guidelines present best practices and lessons learned from existing state programs in an effort to encourage states, schools, and school districts to adopt health-promoting practices in schools. [Colorado](#), [Connecticut](#), [Kentucky](#), [New Hampshire](#), [Washington](#), [Wisconsin](#), and numerous other states have already done significant work in the area of school environmental health. They have promoted implementation of effective integrated pest management<sup>e</sup> practices, indoor air

<sup>e</sup> Integrated pest management is an effective and environmentally sensitive approach to pest management that uses current, comprehensive information on the life cycles of pests and their interactions with the environment, in combination with available pest control methods, to manage pests economically, and with the least possible risk to people, property, and the environment.

## Promoting Environmental Health in Tribal Schools

American Indian and Alaska Native people have long experienced health disparities when compared with other Americans.<sup>33</sup> American Indians and Alaska Natives born today have a life expectancy that is more than 5 years less than the U.S. all races population.<sup>33</sup> The continuing health disparities of American Indians and Alaska Natives point to the importance of ensuring that tribal children have safe places to live, learn, and play. Tribal councils and different tribal agencies, including tribal departments of health, environment, and education will likely have complementary knowledge, expertise, and skills that can be helpful in ensuring that a community, tribal, or Bureau of Indian Education school located in Indian Country (i.e., all lands within the boundaries of an Indian reservation, including fee land) or on other tribal lands provides a healthy learning environment for tribal children. In cases where tribal members attend schools outside of Indian Country, tribes are encouraged to coordinate with state and local governments to ensure that tribal children have the opportunity to learn in a healthy school.<sup>33</sup> Tribes currently promote healthy school environments by:

- ★ Assisting schools with the removal and proper disposal of hazardous chemicals;
- ★ Working to ensure drinking water standards are met at schools;
- ★ Conducting outdoor classroom programs for students; and
- ★ Using culturally based education to implement healthy practices at schools.

Visit EPA Region 8's [Clean, Green, and Healthy Tribal Schools](#) website for more information.

quality programs, healthy energy efficiency policies, and other environmental health-related regulations in schools. Case studies from these programs, and others, are highlighted throughout these guidelines and in [Appendix B](#) to demonstrate best practices that states can follow when establishing state environmental health programs for schools.



### **Basic Elements of a State Environmental Health Program for Schools**

A state environmental health program for schools is characterized by key state agencies (e.g., departments of health, education, energy, and environment) working together along with stakeholders to develop and implement comprehensive policies, best practices, and standards to help schools and school districts address environmental health issues in school facilities. Leadership from a state program can provide schools and school districts with the consistent guidance, resources, tools, and information they need to create healthy school environments for children and staff that promote high student achievement.

Effective state environmental health programs for schools incorporate the following basic elements.

**Policies and Standards** – Several effective state environmental health programs for schools have been built on a foundation of state policies and standards that support, promote, or require schools and school districts to implement practices that promote environmental health. States are encouraged to identify and implement existing policies and standards that can help establish a robust school environmental health program, and to consider whether there are additional opportunities to protect children’s health through the development of additional statewide policies or standards for healthy schools.

### **STATE HIGHLIGHT:**

#### **Wisconsin Green and Healthy Schools**

In 2002, the Wisconsin Department of Natural Resources adopted a model that integrated many existing school environmental health and safety programs as a way to streamline its work with schools. The result was a web-based certification program available to all Wisconsin K-12 schools designed to directly support schools in their quest for a healthy, safe, and environmentally friendly learning environment.

In 2003, the Wisconsin Department of Natural Resources rolled out their Green Schools program. A year later, the agency partnered with the Wisconsin Department of Public Instruction to create the Wisconsin Green and Healthy Schools Program. In the absence of school environmental health legislation/policies at the state level, this voluntary, school-paced program promotes environmental health in schools throughout the state in a comprehensive and accessible manner. As of 2012, there are 140 Wisconsin schools participating in the program.

For more information, visit the [Wisconsin Green and Healthy Schools Program](#) website.

#### **Guidance and Technical Assistance**

– Effective state environmental health programs for schools provide guidance, technical assistance, and tools to help schools and school districts take actions to protect environmental health in their school

facilities. States should ensure that schools are aware of available resources in a way that is comprehensive, user-friendly, and accessible to all schools and school districts.

**Resources** – States should identify training opportunities, educational and promotional materials (e.g., fact sheets and brochures), financial assistance, incentives, and other resources that are available to promote healthy school environments for schools and school districts. States are encouraged to review existing resources to identify gaps that could have an impact on the success of the program. EPA's [Healthy School Environments](#) website provides a wealth of information and tools that can serve as resources for state environmental health programs for schools.

**Communication and Outreach** – States should establish methods for disseminating information to school districts to communicate and gather feedback concerning school environmental health initiatives. It is also important to reach out to potential partners such as colleges and universities, foundations, state associations and non-profit organizations, and other stakeholders that can provide technical assistance and resources to schools and school districts.

**Emergency Management** – An effective state emergency management program or plan focuses on the prevention of environmental health emergencies (e.g., chemical spills, mold and mildew damage, and accidental exposure to contaminants) that could place children and staff at risk. States should have emergency protocols, procedures, and points of contact in place that are accessible to schools, school districts, and the general public. In the event of an emergency, states should provide guidance and recommendations to schools and school districts throughout the emergency situation.

## STATE HIGHLIGHT: Rhode Island

In 2007, Rhode Island passed a set of school construction regulations that require all schools receiving construction funding to implement an indoor air quality management plan and use the [Northeast Collaborative for High Performance Schools protocol](#), which has a strong focus on indoor air quality. Schools are also required to form green teams comprised of school personnel to oversee program implementation and environmental education efforts.

The Rhode Island Department of Primary and Secondary Education (RIDE) has developed a multi-stakeholder, community approach to implement and sustain its school environmental health efforts. RIDE has teamed up with the Rhode Island Department of Health, the National Energy Education Development project, non-profit organizations, universities, and private sector businesses to create outreach materials and provide training. With such a broad coalition of stakeholders, RIDE has helped plan an annual sustainable schools summit. The summit promotes healthy learning environments and provides resources to integrate sustainability practices into school curriculum and culture.

# Developing a Successful State Environmental Health Program for Schools

## Overview: Six Steps for Establishing a State Environmental Health Program for Schools

Before a state develops or enhances an environmental health program for schools, it is necessary to assess existing efforts, develop a plan, and build an infrastructure that will support and sustain the program. Communication with program participants and stakeholders is critical when establishing a state environmental health program for schools. States should develop a communication process, for every step of the program, to continuously incorporate feedback and identify opportunities to enhance the program. The figure and discussion that follow provide an overview of six steps that states can take to establish a successful environmental health program for schools.

### Six Recommended Steps that States Can Take to Build or Enhance a Sustainable State Environmental Health Program for Schools

STEP 1	<b>Assess Existing Resources and Infrastructure</b> Identify a lead office within a state agency that can work with other agencies and assess existing state initiatives and any existing laws, policies, or regulations that address healthy school environments.
STEP 2	<b>Determine Capacity</b> Determine the capacity of each state agency to contribute to an effective state environmental health program for schools.
STEP 3	<b>Develop a Plan</b> Develop an initial plan to establish a new, or enhance an existing, state environmental health program for schools based on available resources.
STEP 4	<b>Implement the Program</b> Work with the lead office or steering committee to ensure the state program is implemented effectively.
STEP 5	<b>Evaluate the Program</b> Evaluate the state program's goals, activities, and milestones to determine whether they need to be revised or expanded to improve the program.
STEP 6	<b>Sustain the Program</b> Utilize the results of state program evaluations to determine the return on investment, make adjustments to the program where needed, and communicate successes.

# STEP 1

## Assess Existing Resources and Infrastructure

Identify a lead office within a state agency that can work with other agencies and assess existing state initiatives and any existing laws, policies, or regulations that address healthy school environments.

Existing state healthy schools initiatives can serve as a foundation for establishing or improving a state environmental health program for schools. By identifying a lead office to coordinate and, where feasible, expand on existing initiatives, states can begin to build the infrastructure necessary to maintain a successful program. The overall infrastructure for the program will vary based on the agencies involved, available resources, and existing policies.

### Leadership and Coordination

Several state agencies are likely to be central to a state environmental health program for schools, including the departments of education, public health, environment, and agriculture. Ideally, an office in one of these agencies will take the lead role in managing the overall program (e.g., Washington's lead agency is the state Department of Health and Connecticut's lead agency is the state Department of Public Health). The lead office should be responsible for coordinating across state agencies with authorities, programs, policies, guidelines, and standards affecting school environmental health. The lead office might already be doing work in an area that can easily be expanded to include school environmental health, or might be an office that has resources (e.g., time, personnel, funds, or subject matter expertise) available to commit to the program. In some cases, non-governmental organizations (NGOs) have acted as conveners of school environmental health activities. One example is the [Maryland Association of](#)

### Environmental and Outdoor Education.

When initiating the program, the lead office should consider reaching out to other states with existing programs to share ideas on potential approaches and strategies for establishing a school environmental health program. At a minimum, the lead office should meet with relevant agencies and departments within the state to better understand, identify, and maintain points of contact for existing environmental health initiatives and resources.

### Steering Committee and Program Partners

Many state and local agencies that provide public health, education, and environmental services (e.g., energy, commerce, and local county health departments) will likely have staff with complementary knowledge, expertise, and skills that can be helpful in developing or enhancing various aspects of a school environmental health program. To ensure better coordination on cross-cutting issues and initiatives, the lead office should work with these agencies to establish an interagency team or steering committee. The steering committee will work to set the direction, scope, and priorities of the program.

The following list provides examples of the many types of participants who could serve on or work with the steering committee to establish an effective state environmental health program for schools:

- State legislators and local administrative officials (e.g., county executives, council members, and mayors);

- Local education authorities (e.g., superintendents, chief academic officers, school board members, and school business officials);
- School administrators and staff (e.g., school administration, nurses, educators, and facility managers);
- Community members (e.g., parents, students, concerned citizens, local college/university outreach partners, and commercial businesses contracted by school districts);
- School organizations and associations (e.g., school health councils, education associations, nurse associations, parent-teacher organizations, and labor/teachers unions); and
- Non-profit/non-governmental organizations (e.g., buildings and grounds associations and asthma coalitions).

The roles of the steering committee members and participants should be well established prior to developing or enhancing a state environmental health program for schools. For instance, one agency might take responsibility for consulting with school districts and providing technical assistance, while another agency might take responsibility for responding to emergency incidents or forming a response team. A program might be strengthened by memoranda of understanding between the lead agency and other participating agencies to help outline the roles and responsibilities of each agency in every aspect of the program.

### Subject Matter Experts

School environmental health can be a complex topic to address. States might need to reach out to various subject matter experts for technical information and additional guidance throughout the development of the program. For example,

## New York State's Guiding Principles for Improving the Environmental Quality of Schools

In December 1994, the New York State Board of Regents adopted a set of guiding principles concerning environmental quality in schools.<sup>34</sup>

- ★ Every child has a right to an environmentally safe and healthy learning environment that is clean and in good repair.
- ★ Every child, parent, and school employee has a “right to know” about environmental health issues and hazards in their school environment.
- ★ School officials and appropriate public agencies should be held accountable for environmentally safe and healthy school facilities.
- ★ Schools should serve as role models for environmentally responsible behavior.
- ★ Federal, state, local, and private sector entities should work together to ensure that resources are used effectively and efficiently to address environmental health and safety concerns.

when determining the proper protocol for addressing specific environmental emergencies, it might be beneficial to consult with experts such as an industrial hygienist for information about environmental testing for mold, or to contact a hazardous material (HAZMAT) specialist to learn more about chemical contamination and clean-up.

Others outside of state agencies, such as [Cooperative Extension System Offices](#), might also be able to provide expertise on promoting healthy school environments. The Cooperative Extension System is a nationwide educational network funded by the U.S. Department of Agriculture to provide research-based information. Cooperative Extension System offices can provide locally relevant information on environmental issues including, but not limited to, radon, mold, and integrated pest management.

Another resource available to state environmental health programs for schools is [Pediatric Environmental Health Specialty Units](#) (PEHSUs), which provide consultation and recommendations on children's environmental health issues. PEHSUs are academically based, typically at university medical centers, and are located across the United States, Canada, and Mexico. PEHSUs form a respected network of experts in children's environmental health that is capable of responding to requests for information throughout North America and can offer advice on prevention, diagnosis, management, and treatment of environmentally related health effects in children. In addition, the PEHSU network can be helpful in interpreting reports or testing results from on-site school environmental health investigations and in providing risk communication to school stakeholders. PEHSUs work with schools and health care professionals, parents, community groups, and others to provide information on protecting children from environmental hazards.

States can leverage PEHSUs as a resource for medical information on health symptoms and advice on environmental conditions that affect children's health at schools. The PEHSU network can work in an advisory

## STATE HIGHLIGHT: Minnesota State Laws

Minnesota's school environmental health program resulted from a change to the Minnesota Department of Education Statute ([Minn. Stat. 123B.57](#)) requiring all schools applying for health and safety funding to develop an indoor air quality management plan. Since then, more than 90% of Minnesota's school districts have implemented an indoor air quality program.

Minnesota has also adopted several other school-specific laws, including a mercury instrument ban and a school bus anti-idling law. School environmental health efforts are coordinated by the Minnesota Department of Health, in cooperation with the Minnesota Department of Education and the Minnesota Pollution Control Agency.

Learn more about Minnesota's [school environmental health initiatives and programs](#).

capacity to assist school districts with specific problems that they might encounter where local resources are not available. Although PEHSUs can be contacted on an as-needed basis for advice on interpretation and messaging regarding specific exposure concerns, they can also be valuable in providing education and directing the lead office and steering committee members toward helpful resources in the planning stages of new programs.

States and steering committees can also consult staff in EPA's Regional offices regarding information and technical

assistance in such areas as children's health, indoor air quality, integrated pest management, chemical management, asbestos, lead, and radon. [EPA Regional Office contacts](#) are available on EPA's website.

## Existing Initiatives

When establishing or enhancing a state environmental health program for schools, it is important to identify and assess existing state healthy schools initiatives such as indoor air quality, integrated pest management, green cleaning, anti-idling, or chemical management efforts. The strengths and opportunities presented by existing school environmental health initiatives can serve as the starting point for an overall state program and can help determine where to focus initial efforts. In addition to assessing existing initiatives, the state emergency management plan should also be reviewed to ensure proper procedures are in place in the event of an environmental emergency (e.g., a chemical spill, mold and mildew damage, or an accidental exposure to contaminants).

As states move toward developing a plan for a new or enhanced state environmental health program for schools, this assessment can serve as a baseline and help identify potential gaps that need to be addressed.

## State Laws and Policies

The foundation of many effective state environmental health programs for schools is state laws and policies that ensure all school districts, including those serving children with disabilities and low-income and minority communities, take steps toward improving environmental conditions in schools by establishing a benchmark or standard to which all schools must comply. The lead office should identify any existing laws, regulations, or policies that can help support a state environmental health program for schools. The lead

office is encouraged to conduct a review of the environmental health-related laws, regulations, and policies that are currently in place. The review should assess how the laws, regulations, and policies are being implemented or enforced within the state to help identify gaps and outdated policies that no longer serve the state's environmental health goals and objectives. This will also help determine ways that existing authorities can be utilized to improve implementation of the state program. The [Environmental Law Institute](#) maintains a database, including an assessment of impact or effectiveness, of state laws and policies covering a variety of school environmental health issues. The lead office should work with the steering committee to consider how existing regulations, policies, and legislation can be used to support, influence, or affect school facility decisions.

The process of reviewing state laws, policies, and regulations should be an ongoing effort. The steering committee can help ensure that the state program remains relevant, effective, and sustainable by building on existing laws and addressing any gaps identified in the review process. The work of the steering committee can be facilitated by reviewing regulations and policies to promote healthy school environments that have been put in place by other states. For example, Connecticut has established several school health laws and policies, including anti-idling and diesel emission reduction laws; a green cleaning mandate for schools; a pesticides-in-schools law; and a law requiring new schools to be constructed to high-performance<sup>f</sup> standards (i.e., energy-efficient, well-ventilated, and good indoor air quality). Existing laws like these and [Connecticut's Indoor Air](#)

<sup>f</sup> High performance refers to whole building systems and the effects of healthy indoor environments on the building's occupants, not just energy efficiency.

**Quality law**, as well as state education and labor laws, can serve as examples and might help other states identify opportunities to strengthen their own state environmental health program for schools. Laws, policies, and regulations that support a state environmental health program for schools might:

- Promote the establishment of local school environmental management systems that consider student and staff health and safety in all practices related to design, construction, renovation, operations, and maintenance of school buildings and grounds.
- Establish specific criteria to ensure that school facility, health, and safety inspections help prevent common environmental health issues found in school facilities (i.e., mold and

moisture, exposure to chemicals and contaminants, poor indoor air quality, pests, and pesticide exposure).

- Recommend that new and renovated school facilities be designed and built to ensure a sustainable, healthy environment that also conserves energy and saves money.
- Ensure that environmental factors are considered in school siting decisions as recommended in [EPA's School Siting Guidelines](#).
- Provide additional support to schools that are identified as most in need of critical infrastructure repair or maintenance.
- Promote healthy energy-efficient products and practices.
- Encourage environmentally safe purchasing policies for school districts.



## Examples of State Policy and Guidance for School Environmental Health

A comprehensive state environmental health program for schools should include policies that address key environmental health issues, including green cleaning, chemical management, indoor air quality, and integrated pest management. States might also choose to go farther and adopt policies that address school construction and energy conservation and efficiency.

This textbox provides an overview of environmental health policies states have developed that could have an impact on school environments. Links to examples of state policy for each environmental health topic are given to provide a starting point for states looking for more information.

### Green Cleaning

When considering a green cleaning policy for your state, the following elements should be included:

- ★ The product categories to be covered by the policy;
- ★ The definition of environmentally preferable products, often referring to third-party certifications;
- ★ A process for stakeholder engagement in developing the policy;
- ★ A process for reviewing and updating the policy; and
- ★ A set of guidelines for outreach and training.

As of March 2012, 10 states (e.g., [Illinois](#), [Missouri](#), and [New York](#)) and the District of Columbia have passed effective state green cleaning policies.

### Chemical Management

States can provide information and establish policies to help schools properly manage chemicals, as well as establish protocols for preventing, addressing, and responding to chemical incidents in schools. States with chemical management policies and guidance include [Colorado](#), [Maryland](#), and [Nebraska](#).

### Indoor Air Quality

When considering an indoor air quality policy for your state, the following elements should be included:

- ★ Minimum requirements for school facility conditions that protect the health and safety of children and staff;
- ★ Oversight measures to ensure the policy's requirements are met; and
- ★ Capacity building measures that enable state agencies to provide resources to assist schools, school districts, and local communities in complying with the policy.

As of March 2012, 33 states (e.g., [Connecticut](#), [Indiana](#), [New Jersey](#), and [Texas](#)) had some type of state regulation regarding indoor air quality in schools.

### Integrated Pest Management

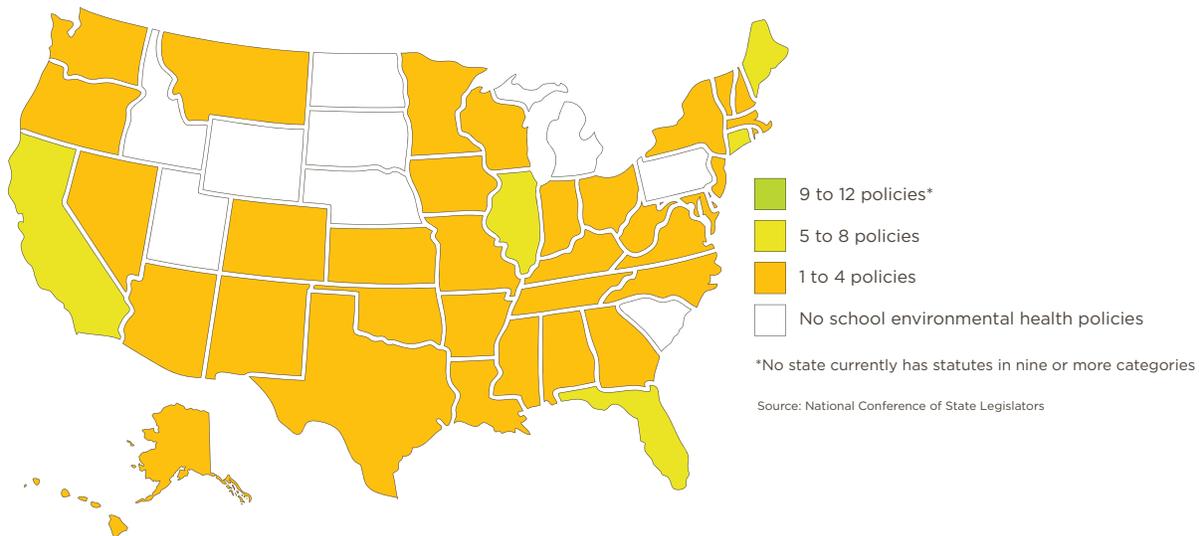
State integrated pest management policies can help schools and school districts prevent pests and reduce pesticide exposure. An effective state integrated pest management policy should include:

- ★ A recommendation for adopting an integrated pest management program;
- ★ Guidelines on when and where pesticides can be applied;
- ★ Signage requirements for pesticide application;
- ★ Required written notification prior to the application of pesticides; and
- ★ Buffer zones around school facilities where pesticides cannot be sprayed.

Existing state integrated pest management programs (e.g., [California](#), [Florida](#), [Pennsylvania](#), and [Texas](#)) are good resources for states to use as guidance in developing standards and policies for integrated pest management in schools.

# State School Environmental Health Statutes At-A-Glance

## Map of State School Environmental Health Statutes



## State School Environmental Health Statutes

State	Children's environmental health	Asbestos	Asthma	Carbon monoxide	Green cleaning	Indoor air	Lead poisoning and hazard reduction	Mercury	Pesticides	Radon	Smoking	Tools for Schools
AL		■										■
AK		■									■	
AS												
AZ						■					■	
AR						■					■	
CA	■	■				■	■	■	■		■	
CO		■				■				■		
CT		■		■	■	■				■	■	■
DE							■					
DC					■							
FL		■			■				■	■	■	
GA		■										
HI					■							
ID												
IL	■	■			■	■			■	■		
IN						■	■	■			■	

*continued on next page*

# State School Environmental Health Statutes At-A-Glance, continued

State	Children's environmental health	Asbestos	Asthma	Carbon monoxide	Green cleaning	Indoor air	Lead poisoning and hazard reduction	Mercury	Pesticides	Radon	Smoking	Tools for Schools
IA					■		■					
KS		■										
KY											■	
LA		■							■		■	
ME		■			■	■	■	■	■		■	
MD	■					■		■	■			
MA						■					■	
MI		■				■			■			
MN		■				■		■	■			
MS		■	■			■			■			
MO		■			■						■	
MT		■				■					■	
NE												
NV		■			■						■	
NH						■						
NJ						■			■	■	■	
NM												■
NY					■	■	■		■			
NC		■					■	■			■	
ND												
OH		■							■			
OK											■	
OR						■			■			
PA												
PR												
RI							■			■	■	
SC												
SD												
TN					■	■						■
TX		■				■					■	■
UT												
VT						■						
VI												
VA		■								■	■	
WA						■						
WV						■			■	■	■	
WI		■				■						
WY												

## STEP 2

### Determine Capacity

Determine the capacity of each state agency to contribute to an effective state environmental health program for schools.

Once existing or potential support has been identified through an assessment of state initiatives, laws, and policies, the next step is to determine the capacity of each state agency to contribute to an environmental health program for schools.

The capacity of state agencies to contribute to an environmental health program for schools depends on having both the authorization and the resources (e.g., time, personnel, funds, or subject matter expertise) needed to support the program. No two states are alike in how they prioritize, prevent, and address environmental health issues in schools. Thus, it is important for states to determine which agencies are authorized or funded to cover environmental health- and education-related concerns. The lead office, working with the steering committee, should determine how each state agency might be able to contribute to a coordinated environmental health program for schools based on the state's priorities or most immediate needs. The areas that will likely benefit from interagency support include:

- Communicating regulations, policies, standards, and recommendations to prevent environmental health threats in schools;
- Developing tools for monitoring local school district practices to track the progress and challenges of providing healthy and safe indoor environments. For example, RIDE encourages schools to use the [Northeast Collaborative for High Performance Schools high-performance scorecard](#) to evaluate the success of their school health programs.

- Engaging with state school-based organizations (e.g., parent-teacher organizations and teachers' unions) to disseminate information and encourage them to communicate with their constituents;
- Coordinating existing resources and tools that can support the state program. For example:
  - Technical assistance for school districts;
  - Potential funding for school districts to implement the program; and
  - Training, certification, and continuing education programs for teachers, administrators, nurses, facility managers, custodians, other school staff, and community leaders.
- Developing an emergency management plan that outlines protocols, procedures, and points of contact that can be used in the event of an environmental health emergency (e.g., a chemical spill, mold and mildew damage, or an accidental exposure to contaminants).

Establishing an effective infrastructure to provide ongoing support is an essential step in ensuring that a state environmental health program for schools will be successful. States should ensure that effective lines of communication, management support, adequate resources, and a coordination group or points of contact for existing initiatives are in place to manage the basic elements of the state program. States can strengthen partnerships with school districts, parents, and communities by establishing accountability procedures for the program and being transparent about the limitations of available resources.

## STEP 3

### Develop a Plan

Develop an initial plan to establish a new, or enhance an existing, state environmental health program for schools based on available resources.

Once a lead office has been established, the existing resources and infrastructure have been identified, and the capacity of each state agency to contribute to an environmental health program for schools has been assessed, the state should use this information to develop a plan for establishing a new, or enhancing an existing, state environmental health program for schools.

The goals and objectives of the state program plan should address how the environmental health program for schools will work to protect the health of children and staff. When setting program priorities, states should first ensure that schools and school districts understand and adhere to local, state, and federal environmental health laws and regulations. States can then focus on ways to help school districts address school facilities with the greatest needs, or those with immediate health issues and concerns (e.g., extensive water damage or mismanaged chemicals). State program plans should give special consideration to ways that assistance can be provided to schools that serve students with disabilities and to school districts in underserved or low-income areas. Schools serving these communities often face the most challenging school environmental health issues.<sup>35</sup> School districts with funding limitations might need additional resources and information to address environmental health concerns. These school districts also could need additional assistance with identifying issues and solutions that are inexpensive to implement and can have an immediate positive impact on the school environment.

States should reach out to potential partners such as colleges and universities, state associations and organizations, and other stakeholders that can provide technical assistance and resources to schools and school districts in these areas.

### Establish Goals and Priorities of the State Program Plan

It is critical for states to develop goals in the early planning stages of an environmental health program for schools to provide focus and a basis for measuring progress. Using the information gathered from the initial program assessment and capacity determination, states can set goals that are clear and measurable, and can be reasonably accomplished within a specified timeframe. Goal-setting provides a tangible roadmap for the state program as it progresses. Thus, states are encouraged to set short-term, intermediate, and long-term goals. It is imperative that all individuals involved in the state program understand the program goals. Examples of general goals include:

- Develop an environmental management system that school districts across the state can adopt to improve the health of children and school staff.
- Promote the importance of environmental health in schools and help school districts identify those schools that could benefit most from an enhanced focus on environmental health (e.g., schools with critical maintenance and repair needs, high absentee rates or above average rates of asthmatic children, children from low-income or underserved communities, and children with disabilities).

- Ensure that resources (e.g., tools, training, and information) are accessible to help school districts implement local school environmental health programs.
- Ensure that procedures, protocols, resources, and points of contact are established to manage environmental health emergencies.
- Establish policies, guidance, and best practices at the state level that address key environmental health issues, including:
  - Green cleaning,
  - Chemical management,
  - Indoor air quality,
  - Integrated pest management,
  - Construction and renovation, and
  - Classroom comfort (e.g., ventilation, acoustics, lighting, and temperature control).
- Identify options for smart materials selection (i.e., products that have less effect on human health and the environment than equivalent, competing products) when building new or renovating existing school facilities, and the use of healthier, less toxic products in all school facilities.
- Provide tools, such as those included in the [model K-12 school environmental health program](#) (found in [Appendix A](#)), that can be adopted by schools and school districts to

## STATE HIGHLIGHT:

### Colorado Connections for Healthy Schools

Colorado Connections for Healthy Schools (CCHS) began in 2003 as part of the CDC's Coordinated School Health strategy. CCHS's mission is to provide a framework to help build Colorado's infrastructure for coordinated school health. Core CCHS partners include:

- ★ Colorado Department of Education;
- ★ Colorado Department of Public Health and the Environment;
- ★ Colorado Legacy Foundation;
- ★ Colorado Health Foundation;
- ★ Center for Research Strategy;
- ★ Creative Media Solutions; and
- ★ RMC Health.

Through grant funding from the Colorado Legacy Foundation and the Colorado Health Foundation, CCHS acknowledges the achievements of schools that scored highest on the Healthy School Champion Scorecard, a self-assessment tool that evaluates a school's performance on the eight components of Coordinated School Health. In the first year, more than 100 Colorado schools submitted scorecards and the top 15 schools received mini-grants.

In 2012, Colorado Connections for Healthy Schools became the Colorado Coalition for Healthy Schools to reflect the program's evolution into a statewide coalition that addresses school health more broadly and comprehensively.

Learn more about the [Colorado Coalition for Healthy Schools](#).

facilitate implementation of their own environmental health programs.

- Develop state learning standards for incorporating environmental health instruction into the student curricula.

To support program goals, a state program plan should include metrics. The metrics should be specific to the goals, resources, and needs of each state. The States of Connecticut and Rhode Island provide two examples of metrics that have been developed for existing school environmental health initiatives that also can be used as metrics for other state programs.

- The State of Connecticut collects data from school districts on health statistics that can be influenced by school environments (e.g., asthma-related data and reductions in absenteeism).
- The State of Rhode Island tracks the number of school districts that are participating in a component of the state program (e.g., EPA's IAQ Tools for Schools) or that have implemented the overall state program.

## Emergency Management

Schools and school districts need to know the appropriate procedures and points of contact when faced with an environmental emergency. States can assist in these emergency situations by ensuring that schools and school districts are included in, and are aware of, the state emergency management plan. Emergency management planning can help ensure that states, schools, school districts, parents, and local communities are equipped to respond properly to environmental emergencies in schools. If one does not already exist, states are urged to develop an emergency management plan prior to implementing the environmental health program for schools. Basic emergency management and

preparedness at the state level involves:

- Maintaining a consistent and up-to-date emergency preparedness guide and occupant emergency action plan;
- District-wide emergency preparedness training on topics such as safety drills, emergency evacuation, chemical spills and contamination, shelter-in-place, bomb threats, poison control, natural disasters, and fire;
- Addressing the unique needs of children with disabilities;
- Identifying reliable consultation service(s) with industrial hygienists, physicians, HAZMAT teams, and PEHSUs;
- Ensuring points of contact for reporting potential environmental health concerns are identified and available to stakeholders and local communities;
- Establishing a reporting and investigation process for addressing incident reports;
- Conducting periodic assessments of new and emerging hazards relevant to schools; and
- Providing frequent guidance and recommendations to schools and school districts throughout the emergency situation.

States are encouraged to provide an emergency preparedness guide as a general safety directive to which schools and school districts can refer for various emergencies as part of the emergency management plan. States also should consider including an occupant emergency action plan outlining protocols and procedures that can be used or adapted by schools and school districts to reflect specific information (e.g., individual school building structures, fire department regulations, school chemical inventories, and procedures for assisting children with disabilities). At a minimum, states should set

up a process that schools, school districts, parents, and local communities can follow to report environmental emergencies and incidents.

## Program Implementation

Developing a strategy for implementing a state environmental health program for schools is a key component of the program plan. Methods for implementation will vary across states and will be driven by each state's needs and available resources.

The lead office can work with the program participants or the steering committee to develop an implementation strategy that:

- Outlines the goals of the program;
- Identifies the activities to be completed for each goal;
- Defines a timeline for taking action toward each program goal;
- Lists the resources and funding needed to implement the program;

### STATE HIGHLIGHT:

#### Washington School Environmental Health and Safety Program

The School Environmental Health and Safety (SchEH&S) Program in Washington's Department of Health is guided by state school environmental health policies. In 1955, Washington passed the State Board of Health Rule for Primary and Secondary Schools, which established minimum environmental health and safety standards for education facilities (e.g., siting, lighting, ventilation, noise, heating, and safety). In the mid-1990s, the Washington State Department of Health and the Office of the Superintendent of Public Instruction brought together a range of school stakeholders to develop one set of guidelines on health and safety rules and best practices for K-12 schools: the *Health and Safety Guide for K-12 Schools in Washington* (2000, 2003, 2012).

The Department of Health SchEH&S Program places a strong emphasis on technical assistance, training, and education. The program works with federal, state, and local partners to provide technical assistance to local health jurisdictions and school staff (e.g., risk managers, maintenance and operations staff, custodians, nurses, and administrators) on environmental health and safety issues. For example, the Department of Health, the King County Local Hazardous Waste Management Program, state agencies, Educational Service Districts, Washington State University, and EPA provide technical assistance and training on integrated pest management, safe chemical management, and lab safety in schools. Other key partners include the Washington State Coordinated School Health Program and the Pacific Northwest Pediatric Environmental Health Specialty Unit.

The Department of Health SchEH&S Program promotes school environmental health and safety through presentations to, and participation in, various school and public health trainings and committee work. The program holds an annual fall workshop that brings local health jurisdictions and school staff together to network and receive information on school environmental health and safety. Newsletters, listservs, and the Department of Health SchEH&S website are additional tools used to reach target audiences.

Learn more about [Washington's School Environmental Health and Safety Program](#).

- Incorporates a communication plan outlining how information and resources will be disseminated to school districts and program participants;
- Identifies training needed to implement the program;
- Defines milestones and measurement criteria to guide and assess program progress;
- Establishes a process for tracking the milestones and measurement criteria that will be used to guide and assess program progress;
- Ensures compliance with all federal, state, and local environmental laws and regulations; and
- Enforces existing policies, sets school standards, modifies school inspection criteria, or adds school environmental health responsibilities to position descriptions to institutionalize and sustain the program.

As part of the implementation strategy, states can consider customizing the [model K-12 school environmental health program](#) (found in [Appendix A](#)) to reflect their priorities. Customized information can include specific policies and standards for environmental health issues; emergency management protocols, procedures, and points of contact; and local resources that can assist schools and school districts in developing and sustaining their own environmental health programs and activities. The customized model program can be disseminated to schools and school districts by states as part of an outreach campaign to generate interest and participation in the state program.

## Public Communication and Outreach

Regular, effective, and transparent communication is vital to the state program's success. In addition to school

districts and program participants, parents and local communities need to understand school environmental health issues and how the state program will help protect children and school staff. Prior to implementing an environmental health program for schools, states are encouraged to develop a communication strategy that outlines how program information will be shared with schools, school districts, parents, and local communities. States should consider using practical and creative outreach methods to increase program support including websites, social media, newsletters, articles, and listservs. To keep the public engaged in the program, states can center communication efforts on key topics such as:

- The priorities, goals, and benefits of the program;
- How the program will address underserved communities or populations, or those that might be disproportionately impacted by environmental risks (e.g., low-income and minority populations and children with disabilities);
- Which schools and school districts are taking action toward implementing environmental health programs;
- Assessments of school conditions;
- Interventions concerning school environmental health issues; and
- Points of contact for additional information and to report concerns.

States should identify key messages and opportunities to keep the public engaged and informed of actions that are being taken within the state to create healthy school environments for children and school staff.

## Staff Training and Education

Providing training and education opportunities to state program participants as part of the program implementation

is crucial for future success. Training can be provided by the state, members of the steering committee, a trainer with expertise in school environmental health, a partnership between governmental organizations and NGOs, or successful peer trainers. Trainers should be able to speak from experience and communicate effectively with the audience. In addition to having the expertise to address environmental health issues in schools, the [PEHSU network](#) can serve as a resource in identifying existing evidence-based curricula or presentations to assist with the training process. Training topics could include:

- Children’s environmental health and safety in schools,
- The basic elements of the state program,
- Plans for implementing the state program,
- Best practices and lessons learned from existing state environmental health programs for schools, and
- The policies or standards currently in place that support the state program.

Educational material and information might include:

- An overview of children’s environmental health issues;
- Actions that schools and school districts can take to ensure that school environments are healthy;
- Resources available to schools and school districts like [EPA’s IAQ School Champions](#) and [EPA’s IAQ National Schools Network](#), which help schools and school districts learn more about the strategies, challenges, and commitments of others to protect children and school staff on a peer-to-peer basis;
- Protocols, procedures, and points of contact for environmental health emergencies;

- Existing training, certification, continuing education, and other learning opportunities for program participants;
- Outreach tools and approaches (e.g., public television, events, word-of-mouth campaigns, peer-to-peer collaboration, and social networking) to increase awareness of the state program; and
- Feedback, success stories, and lessons learned.

## Measures to Assess Progress

Having measures to assess progress can help sustain state environmental health programs for schools. When planning and coordinating the program, it is important for states to recognize early program success. Communicating milestones such as identifying the top priorities for the program and developing an emergency management plan can keep interest and enthusiasm high. Once the program has been implemented, immediate successes like increased participation, new partnerships, and incremental steps that schools or school districts take to adopt the program can be used to help measure progress. Data obtained by conducting site visits, regular reporting, and other methods can help benchmark efforts and outcomes across school districts within a state. Some baseline data might already exist (e.g., absenteeism rates and energy use). The steering committee can help establish a mechanism and timeline for tracking progress, and can determine whether the measurement plans need to be vetted by a human subjects research review process (e.g., a state institutional review board). States can use this information to make key decisions and to identify strengths, weaknesses, and gaps in the overall program.

After considering and applying these initial steps, states might wish to consider piloting the program among selected schools or school districts before implementing the program more broadly.

## STEP 4

### Implement the Program

Work with the lead office or steering committee to ensure the state program is implemented effectively.

Implementation will depend greatly on the state program's goals, priorities, and resources. For example, the [Wisconsin Green and Healthy Schools Program](#) worked with individual schools to complete a three-step certification process, and the [New Hampshire Partners for Healthy Schools Program](#) leveraged partnerships with state agencies and non-profit organizations to provide free assessment training, technical assistance, and mentoring to address environmental needs identified by schools.

State program implementation might incorporate a variety of strategies such as broadly announcing the program and making basic information readily available to school districts and the general public (e.g., existing resources, tools, and points of contact for the program). In cases where states are expanding existing environmental health programs for schools, implementation can involve sharing information about the new aspects of the program or providing a centralized source of information pertinent to school environmental health. Effective communication and outreach are instrumental in getting schools, school districts, parents, school staff, and students engaged to support and sustain school environmental health programs. Communication and outreach to parents, students, and the general public can include information such as:

- The state program's goals;
- Pertinent federal, state, and local laws and regulations;
- Tools and resources available to help

### STEPS 4-6: Implementing and Sustaining a Successful Environmental Health Program for Schools

Steps 4-6 outline actions that states can take to implement and sustain a state environmental health program for schools.

support or participate in the state program;

- Methods for providing feedback on the state program (e.g., for administrators, teachers, students, and parents);
- Points of contact for additional information and technical assistance; and
- Recognition of successful school districts or school initiatives and those schools and school districts making incremental changes.

The lead office or the steering committee can also reach out to individuals and organizations, such as public health professionals, parent-teacher organizations, schools of public health, and colleges and universities to partner with them in support of school districts and their efforts to create healthy school environments. An excellent example of successfully implementing a state environmental health program for schools can be found in [Connecticut's Tools for Schools program](#).

## STATE HIGHLIGHT:

### Connecticut Tools for Schools Program

In 1999, representatives from the Connecticut Department of Public Health, EPA Region 1, and the Connecticut Council for Occupational Safety and Health began meeting to develop a comprehensive and coordinated statewide strategy to promote EPA's IAQ Tools for Schools Action Kit and program as a viable, proactive intervention to address indoor air quality problems in Connecticut schools. Connecticut's work has led to the development of a statewide, multiagency consortium, the Connecticut School Indoor Environment Resource Team (CSIERT). Since its inception, CSIERT has expanded Connecticut's program to address a variety of environmental health issues.

By implementing the EPA IAQ Tools for Schools program, the state of Connecticut has helped address indoor air quality issues in more than 800 schools. School districts throughout the state have benefitted from implementing this component of a K-12 school environmental health program through:

#### **Improved Health Outcomes within Connecticut School Districts**

- ★ An 11% reduction in the number of visits to school nurses. (North Haven)
- ★ A decline of 21.2% in asthma incidents in 1 year. (Hartford)
- ★ Absenteeism cut by more than half. (Hamden)
- ★ A decrease of 48% in the number of reported cases of respiratory-related illnesses. (North Haven)
- ★ Number of asthma-related health office visits decreased from 463 to 82 over 4 years. (Chester)

#### **Cost Savings for Connecticut School Districts**

- ★ Decreased indoor air quality related workers compensation claims. The average decrease was 3.6 claims. The severity of claims decreased 87%, for a total savings of \$56,705.
- ★ Decreased energy costs with well-maintained buildings and equipment.

#### **Positive Public Relations**

- ★ Positive feedback from teachers' unions.
- ★ Positive media coverage.
- ★ Improved faculty and school staff morale.
- ★ Increased community trust.

Visit the [Connecticut Tools for Schools](#) website for more information.

# STEP 5

## Evaluate the Program

Evaluate the state program's goals, activities, and milestones to determine whether they need to be revised or expanded to improve the program.

An important part of implementing the state environmental health program for schools is evaluating progress made toward adopting the state program, as well as the program's goals, activities, and milestones, to determine whether they need to be revised or expanded to improve the program. Ideally, school districts and other stakeholders should take part in the evaluation. Evaluations should be conducted on a regular basis and might include:

- Assessing progress toward meeting the short-term, intermediate, and long-term goals as established in Step 3;
- Revisiting and updating the program priorities, as needed;
- Reviewing the effectiveness of relevant state environmental health policies;
- Identifying any new funding sources;
- Analyzing how well the strategies for each goal have worked in practice;
- Identifying any success factors and best practices;
- Recognizing any obstacles or challenges encountered when implementing the program;
- Identifying areas of the program that need improvement or refinement (e.g., the emergency management plan or communication and outreach strategy);
- Assessing the training opportunities and resources that states provide to program participants and school districts;

- Assessing each school district's progress toward implementing environmental health programs in schools; and
- Reviewing the membership of the steering committee or program participants, as necessary.

States should identify and acknowledge schools and school districts that are making incremental changes to create healthier learning environments, and encourage those that are addressing environmental health issues to evaluate their progress on a regular basis. The CDC's [School Health Profiles](#) (Profiles) is a useful tool for assessing existing health policies and practices in schools. Profiles is a system of surveys conducted every 2 years by many state education and health agencies among middle and high school principals and lead health education teachers. States can administer Profiles to monitor what proportion of schools in their jurisdiction have school improvement plans that include healthy school environment objectives; have a school health council, committee, or team; have tobacco-free school policies; and have attempted to minimize asthma triggers in the school environment.

EPA's [Healthy School Environments Assessment Tool \(HealthySEATv2\)](#) is another useful tool that states can encourage school districts to use to measure progress in individual schools. HealthySEATv2 is a fully customizable software program designed to help school districts evaluate and manage all of their environmental, safety, and health

issues and can help standardize reporting among different school districts within a state.

States should collaborate with schools and school districts to share successes and lessons learned. States should establish mechanisms (e.g., newsletters, an annual meeting, participating in existing school board meetings, conference calls, and webinars) that allow schools and

school districts to share their program evaluations, discuss the results, and provide recommendations to other schools for improvement, if needed. States can also encourage school districts with successful environmental health programs to mentor other school districts in best practices for developing and implementing sustainable program strategies.

## Examples of States and School Districts Adopting HealthySEAT

- ★ The Ohio Department of Health has posted a customized version of HealthySEAT on the Ohio Department of Health website to help school districts and local health departments conduct annual inspections of school buildings and grounds to identify health and safety concerns.
- ★ The New Hampshire Department of Environmental Services has developed a version of HealthySEAT with specific information customized for New Hampshire. New Hampshire HealthySEAT is designed to be used as a starting point for New Hampshire school districts to further customize HealthySEAT for use in their own districts. The project is a partnership of the New Hampshire Department of Environmental Services, the New Hampshire Department of Health and Human Services, the New Hampshire Department of Education, health departments in the cities of Manchester and Nashua, and the New Hampshire Partnership for High Performance Schools.
- ★ The Mississippi Department of Environmental Quality received an EPA Indoor Environments grant award of \$28,900 to integrate the environmental health and safety requirements and best practices from Mississippi's Education, Environmental and Health Programs into HealthySEAT. The grant also included piloting HealthySEAT with the Cleveland School District and incorporating lessons learned and successes realized into a training program to be conducted for other school districts.
- ★ In conjunction with their indoor air quality walkthrough and incident reports, Katy Independent School District in Texas is using HealthySEAT to record their indoor air quality assessments and develop an indoor air quality profile for each school and facility. HealthySEAT is helping Katy document each school's unique environmental health issues so they can be resolved in a timely and cost-effective manner.

## STEP 6

### Sustain the Program

Utilize the results of state program evaluations to determine the return on investment, make adjustments to the program where needed, and communicate successes.

The results of the state program evaluations should be used to make adjustments, as needed, to enhance and sustain a successful state environmental health program for schools. States can use the results of the program evaluation to:

- Demonstrate a return on investment;
- Update program training;
- Revise existing policies and procedures;
- Develop policies and procedures for additional environmental health issues;
- Revise program goals and strategies;
- Implement activities in new priority areas;
- Communicate successful approaches from state, school, or school district programs; and
- Identify and engage new steering committee members, partners, and champions to help promote, support, and provide additional resources for the state program.

Sustaining a successful state environmental health program for schools requires demonstrated management support and a consistent commitment over time. States should continue to engage steering committee members to offer insights on emerging environmental health issues, and develop policies and programs that further support the program's goals. States should also keep schools and school districts informed about updates to the program, as well as new policies, tools, and resources that become available.

### U.S. Department of Education Green Ribbon Schools Recognition Award

The U.S. Department of Education [Green Ribbon Schools Recognition Award](#) recognizes schools that save energy, reduce costs, feature environmentally sustainable learning spaces, protect health, foster wellness, and offer environmental education to boost academic achievement and community engagement. States can nominate schools where staff, students, officials, and communities have worked together to produce energy-efficient, sustainable, and healthy school environments. Seventy-eight schools from 29 states and Washington DC were recognized for the 2011–2012 inaugural year of Green Ribbon Schools.

State environmental health programs for schools can help schools meet Green Ribbon Schools award requirements, and states should encourage schools and school districts to participate.

Another way states can sustain successful programs is through public-private partnerships. By partnering with businesses, colleges and universities, and trade associations, states can obtain needed

expertise and resources to maintain and enhance school environmental health programs. States also can encourage participation in, and improvement of, environmental health activities across school districts by offering recognition or incentives, such as:

- Recognizing and sharing successful school district efforts;
- Nominating schools for national or state awards (e.g., the [U.S. Department of Education Green Ribbon Schools Recognition Award](#), [Florida's Governor Serve to Preserve Green Schools Award](#), and [Texas's Green Ribbon Schools Award](#));
- Creating a state recognition program if one does not exist;
- Creating new non-financial incentives; or
- Collaborating with independent or non-profit organizations to provide financial incentives.

Above all, states should share successes with members of the community. Communicating progress and success is necessary to maintain support for a state environmental health program for schools. Newsletters, listservs, and the Governor's State of the State report are just some methods for sharing successes. The lead office should keep documentation and good records of program progress to facilitate communication. Examples of such documentation include:

- Case studies of schools and school districts that have adopted a school environmental health program,
- Yearly progress reports,
- Performance measures,
- Absenteeism information, and
- Expenditures and other budgetary data.



# Tools and Resources to Assist States with Environmental Health Programs for Schools

Several tools and resources are available to assist states with implementing and sustaining an environmental health program for schools. Many of these tools and resources are included in [Appendix C: Additional Information and Resources](#). Two well-established resources are EPA's IAQ Tools for Schools program and the CDC's Coordinated School Health strategy, summarized in the text below and in the figures that follow. The IAQ Tools for Schools Framework for Effective School IAQ Management has become the standard for schools that are looking to initiate proactive indoor air quality practices (see [IAQ Tools for Schools At-a-Glance](#)). In 2006, 51% of U.S. schools had an indoor air quality management program and among those schools, 85% based their program on EPA's IAQ Tools for Schools program.<sup>36</sup> These schools are significantly more likely to be addressing key environmental health risks (e.g., mold and moisture, pests, and mismanaged chemicals) compared to schools without an indoor air quality management program. School districts already implementing IAQ Tools for Schools, and districts just beginning to think about developing a comprehensive environmental health program, will find the IAQ Tools for Schools platform an effective model on which to build.

Ideally, a school's efforts to promote a healthy environment should be part of a Coordinated School Health strategy. A Coordinated School Health strategy is an approach to improving the health and well-being of all students so they can fully participate and be successful in school. The process involves bringing together school administrators, teachers,

other school staff, students, families, and community members to assess health needs; set priorities; and plan, implement, and evaluate all health-related activities (see "Energy Independence and Security Act of 2007").<sup>37</sup> A Coordinated School Health strategy integrates health promotion efforts across eight interrelated components that already exist to some extent in most schools, including:

- Health education;
- Physical education;
- Health services;
- Nutrition services;
- Counseling, psychological, and social services;
- Healthy and safe school environments;
- Staff wellness; and
- Family and community involvement.

States that have adopted a Coordinated School Health strategy for use in their schools are encouraged to use these guidelines to help schools and school districts improve their environmental health programs. As one of the major components of a Coordinated School Health strategy, initial steps to promote healthy school environments (e.g., adopting tobacco-free policies or implementing policies to address environmental asthma triggers) are often the starting point for schools and school districts to implement a broader, coordinated approach to student and staff health. For more information, visit CDC's website on [Coordinated School Health](#).

As an additional resource for states, EPA has developed a [model K-12 school](#)

[environmental health program](#), presented in [Appendix A](#) of this document, which can be adapted by states to reflect state environmental health goals and resources. The model program focuses on five broad components of environmental health issues that schools should address to ensure that school environments are healthy and promote high achievement by children and school staff. These five components are:

- Practice Effective Cleaning and Maintenance,
- Prevent Mold and Moisture,
- Reduce Chemical and Environmental Contaminant Hazards,
- Ensure Good Ventilation, and
- Prevent Pests and Reduce Pesticide Exposure.

In addition to these components, the EPA model program covers topics including new construction and renovation projects; enhancing classroom comfort (e.g., lighting, acoustics, ventilation, and temperature control); becoming more energy- and water-efficient; faculty and staff training;

and student curricula. States are encouraged to customize the EPA model program to reflect their school environmental health policies, emergency management procedures, and local resources to help schools and school districts best address their school environmental health needs.

## Summary

Effective state environmental health programs for schools promote safe, clean, and well-maintained school buildings and grounds; create environments that are conducive to learning; and protect the health of children and school staff. The practices recommended in these voluntary guidelines have been successfully implemented by states, and can be applied, with appropriate adaptation, to a wide range of school-related institutions, including child care and early learning centers. EPA will work with federal, state, and local partners to support implementation of these guidelines and share best practices to ensure healthy learning environments for the nation's children.



# IAQ Tools for Schools At-A-Glance

## EPA's IAQ Tools for Schools Framework for a K-12 School Environmental Health Program

IAQ Tools for Schools is a flexible, comprehensive resource for environmental health in school buildings. The IAQ Tools for Schools approach provides strategies and a robust suite of tools to help schools identify, correct, and prevent a wide range of environmental health and safety risks, and to put in place a sustainable system to institutionalize a successful program at the school or school district level. The framework provides a common language to describe the drivers of IAQ program success; detailed guidance on the proven strategies, organizational approaches, and leadership styles that are fundamental to program effectiveness; and a clear vision of the pathway to school IAQ excellence. Its highly flexible and adaptable structure allows any school or school district, regardless of location, size, budget, or condition, to use the framework to launch, reinvigorate, and sustain an effective indoor air quality management program.

### The Framework for Effective School IAQ Management: SIX KEY DRIVERS

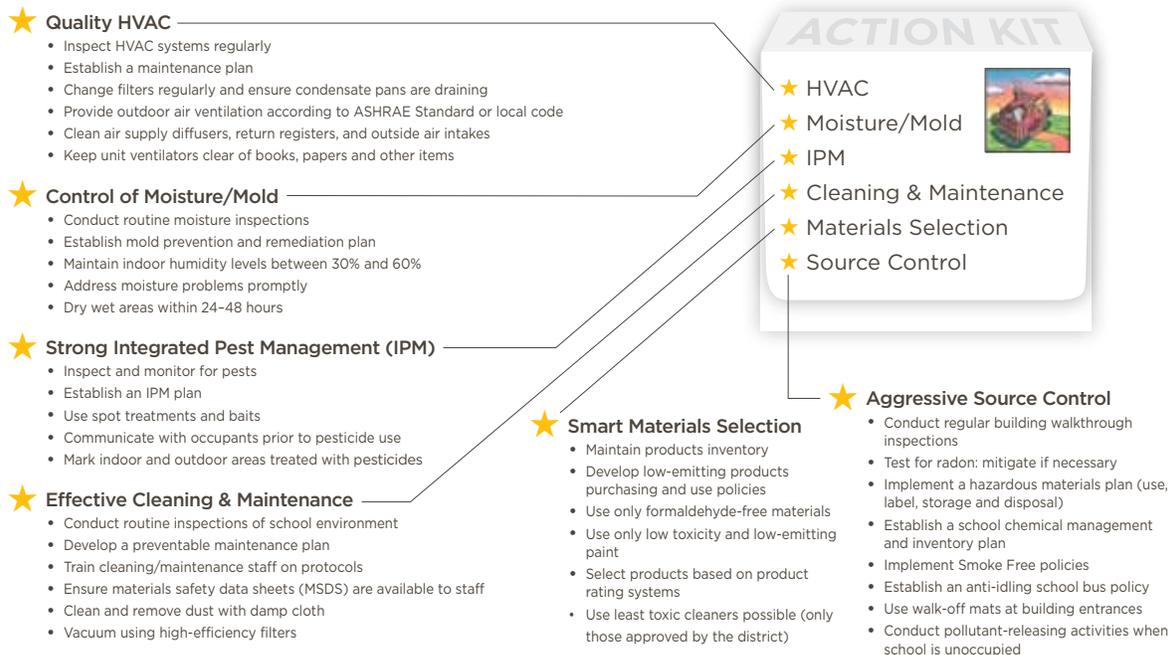


## IAQ Tools for Schools At-A-Glance, continued

The core elements of the IAQ Tools for Schools Framework are the Key Drivers and the Technical Solutions. The Key Drivers are the essential functions of effective and enduring indoor air quality management programs: Organize, Communicate, Assess, Plan, Act, and Evaluate. The Technical Solutions define the most common issues that schools need to address to effectively manage indoor air quality risks: Quality HVAC, Control of Moisture and Mold, Integrated Pest Management, Effective Cleaning and Maintenance, Smart Materials Selection, and Aggressive Source Control.

Learn more about the [IAQ Tools for Schools Framework, tools, and resources](#).

### The Framework for Effective School IAQ Management: SIX TECHNICAL SOLUTIONS



# Implementing Coordinated School Health

## How **States** Can Implement a Coordinated School Health Strategy

**Monitor and assess** the effectiveness of school health policies and programs in promoting healthy behaviors and reducing risky ones (e.g., CDC's [School Health Profiles](#) survey).

**Build an infrastructure** within the lead agency that supports personnel and organizational involvement, authorization and funding, technical assistance and resources, and communication.

**Build partnerships** among state level government agencies and NGOs to coordinate efforts and maximize resources (e.g., establish a state school health coordinating council).

**Establish policies** to help schools implement and coordinate their school health efforts (e.g., provide model policies to local school districts and develop curriculum standards to guide instruction and content).

**Establish a technical assistance and resource plan** to support school districts in their Coordinated School Health efforts (e.g., establish criteria to help school districts develop, assess,

and select health curricula; identify resources for developing school health policies and for assessing and planning school health programs; and identify national standards and guidelines for Coordinated School Health components and disseminate to school districts).

**Communicate** the roles and benefits of a Coordinated School Health strategy to key audiences.

**Develop a professional development plan** for school officials and others responsible for implementing a Coordinated School Health strategy and school health initiatives.

**Establish a system for evaluation** to improve state and local school health policies and programs (e.g., develop procedures for measuring program goals, objectives, and implementation plans to assess the development and implementation of health-related education policies).

For more information, visit CDC's website on [Coordinated School Health](#).

## Implementing Coordinated School Health, continued

### How **Schools and School Districts** Can Implement a Coordinated School Health Strategy

**Secure and maintain administrative support and commitment.** School administrators can provide support by incorporating health in the school's or school district's vision and mission statements; appointing someone to oversee school health; allocating resources; and communicating the importance of wellness to students, school staff, and parents.

**Establish a school health council or team.** *District school health councils* include at least one representative from each Coordinated School Health component, and school administrators, parents, students, and community representatives involved in the health and well-being of students. *School health teams* include a site administrator, an identified school health leader, teachers and other staff representing the Coordinated School Health components, parents, students, and community representatives (when appropriate).

**Identify a school health coordinator.** The school health coordinator helps maintain active school health councils; facilitates health programming; organizes activities addressing the Coordinated School Health components; and facilitates actions to achieve a successful, coordinated school health system (e.g., policies, programs, activities, and resources).

**Develop a plan.** The plan should present a strategy for achieving health promotion goals and fit into a school's overall improvement plan to link health with learning outcomes.

**Implement multiple strategies through multiple components.** Each Coordinated School Health component employs a unique set of strategies, including classroom instruction, policies and procedures, environmental change, health, counseling and nutrition services, parent and community involvement, and social support. No single strategy or single component, however, will achieve all the desired health outcomes for all students. Implementing all components is necessary so every strategy can be used to address health behaviors and improve student learning.

**Focus on students.** The focus of a Coordinated School Health strategy should be on meeting the education and health needs of students, and providing opportunities for students to be meaningfully involved in the school and the community.

**Address priority health-enhancing and health-risk behaviors.** Schools can implement policies and programs to help students avoid or reduce health-risk behaviors that contribute to the leading causes of death and disability among young people as well as among adults.

**Provide professional development for staff.** Professional development provides opportunities for school employees to identify areas for improvement, learn about and use proven practices, solve problems, develop skills, and reflect on and practice new strategies.

For more information, visit CDC's website on [Coordinated School Health](#).

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# Appendix A | Model K-12 School Environmental Health Program

Recommended Activities to Promote Healthy  
Environments in Schools and School Districts



## **Voluntary Guidelines for States**

Development and Implementation of a  
School Environmental Health Program

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# What is a School Environmental Health Program?

A school environmental health program is a holistic, comprehensive, and actionable strategy that integrates preventive measures and addresses environmental health issues by fostering well-maintained school buildings and grounds. Sustainable school environmental health programs promote environments that are conducive to learning and protect the health of building occupants. In addition to improving the school's physical environment and minimizing potential health risks, school environmental health programs help local communities, schools, and school districts make healthy, safe, and cost-effective choices that address each school's environmental health priorities. Some of the benefits to schools and school districts include:

- Improvements in children's health;
- Decreased rates of absenteeism for children and teachers;
- Stronger student academic performance and participation in the classroom;
- Greater teacher retention and job satisfaction; and
- Cost savings through energy and water conservation and efficiency, and improved facility maintenance.

States are encouraged to utilize their existing laws, regulations, and policies—in conjunction with the information provided in this model—to provide schools with a customized resource to help create healthy school environments for children and staff. Although no single program model must be followed in establishing a school environmental health program, the U.S. Environmental Protection Agency's (EPA) [Indoor Air Quality \(IAQ\) Tools for Schools](#)

program framework and technical solutions have been widely adopted by schools and school districts over the past 15 years. In fact, the Centers for Disease Control and Prevention's (CDC) [2006 School Health Policies and Programs Study](#) estimated that more than half of all schools have an indoor air quality program in place and more than 85% base their program on the IAQ Tools for Schools model.

For the tens of thousands of schools familiar with the IAQ Tools for Schools framework and technical solutions, IAQ Tools for Schools is a logical platform from which many school environmental health issues can be tackled. EPA encourages states, schools, and school districts to use the IAQ

## More Information on the Importance of Environmental Health in K-12 Schools

The book [Safe and Healthy School Environments](#) explores the school environment using the methods and perspectives of environmental health science. Although environmental health has long been understood to be an important factor in workplaces, homes, and communities, this book addresses the same basic concerns in schools. The editors are physicians and educators trained in pediatrics, occupational and environmental medicine, and medical toxicology, and the authors are experts in their fields, in the United States and abroad.

## The Framework for Effective School IAQ Management: SIX KEY DRIVERS



Tools for Schools framework and the model program that follows to identify actions and resources that might be of use to schools for building or further strengthening their school environmental health programs.

The following model program provides guidance for schools and school districts that are beginning to develop, or are strengthening, a school environmental health program, including the key steps for implementing a program and practical actions that schools can take to address a wide range of environmental issues. The model program groups these environmental issues into five broad components:

- Practice Effective Cleaning and Maintenance,
- Prevent Mold and Moisture,
- Reduce Chemical and Environmental Contaminant Hazards,
- Ensure Good Ventilation, and
- Prevent Pests and Reduce Pesticide Use.

The model program also includes examples of how schools have approached environmental health issues and links to other valuable resources to help schools develop comprehensive school environmental health programs.

School environmental health programs should be dynamic and need to evolve as schools and school districts identify new priorities, set new goals, and balance existing resources. This model program can be modified to meet the changing needs of a school or school district, and should be updated to reflect a school or school district's current priorities, goals, and resources.

### The Important Role of State Policy in School Environmental Health Programs

State policy development and implementation plays a critical role in promoting healthy school environments. A number of states have regulations, policies, and guidance that address key

environmental health issues in schools, including green cleaning, chemical management, indoor air quality, and integrated pest management. The existing policies, regulations, and guidance can help schools and school districts take the necessary steps to improve environmental conditions in schools by establishing a benchmark or standard to which all schools should or must comply.

This model program is intended to be a resource for states to provide to schools and school districts to help them address environmental health issues. States are

encouraged to customize the model program to reflect existing regulations, policies, and guidance that promote school environmental health; emergency management protocols, procedures, and points of contact; and existing resources that can help schools and school districts develop and sustain their own environmental health programs and activities. States are also encouraged to use the model program as a resource for considering new regulations, policies, and guidance that might be helpful in promoting healthy school environments.



# Getting Started: Tips for Successful Program Development and Implementation

Effective school environmental health programs are built through collaboration among all members of the school community. A successful and well-coordinated school environmental health program is characterized by school administrators, teachers, staff, facility managers, and students who view health protection and promotion as an essential part of meeting the school's mission. The most successful school environmental health programs will use an ongoing process to develop, implement, and evaluate policies, procedures, and practices that strive for continuous improvement. Before a school develops its environmental health program, it will need to build an infrastructure that will support and sustain the program. The following steps are essential for a school or school district preparing to implement a school environmental health program.

## Secure Leadership Support

The first step to implementing a school environmental health program should be securing support from senior leadership of the school or school district (e.g., district superintendent, school principal, or school board). School administrators can support the program in many ways, including:

- Incorporating environmental health in the school's or school district's vision and mission statements;
- Allocating resources specifically for program policies, procedures, and practices; and
- Communicating the goals of the program to the school community.

## Establish a District or School Environmental Health Team or Committee

More than 70% of school districts and more than one-third of schools have a school health council, team, or committee that offers guidance on the development of policies or coordinated health activities. To promote a healthy school environment, schools and school districts are encouraged to work with an existing council, team, or committee to form an environmental health team or committee that can help develop and implement a school environmental health program, and serve as a resource for parents and the surrounding community. Members should include administrators, teachers, school nurses or other health services staff, and facility managers. At least one person on the team or committee should have experience in emergency management. The environmental health team or committee would also benefit from including students, parents, the state or local coordinated school health representative, and community agencies and organizations (e.g., local health jurisdictions and colleges and universities). Team or committee members should understand their roles in promoting healthy school environments and be able to communicate this information when questions or concerns about the school environment are raised. The team or committee should develop a communication plan that emphasizes timely and transparent communication with the public and within the school and school district to sustain support from

school administrators, school staff, parents, and other community members for environmental health activities.

## Identify Priorities and Goals

Identifying areas of greatest concern/ interest for each school and developing a list of priorities are important tasks for the environmental health team or committee. Setting priorities will depend on several factors:

- Urgency of the environmental health issues present at the school;
- Impact/benefit of addressing the issue;
- Ability to make significant progress within a set timeframe;
- Resource constraints; and
- Stakeholder support.

The environmental health priorities identified by the environmental health team or committee can be used as a guide to develop a list of program goals that are clear, measureable, and can be reasonably accomplished within a specified timeframe. Examples of general goals include:

- Improve indoor air quality by adopting EPA's IAQ Tools for Schools program;
- Reduce classroom chemical hazards by removing dangerous chemicals, adopting green chemistry curricula, and purchasing only the amounts of chemicals needed;
- Ensure safe drinking water by testing for lead at all drinking water taps and taking mitigation steps when lead concentrations exceed recommended health-based benchmarks;
- Reduce unnecessary idling by adopting an anti-idling policy for school buses, passenger vehicles, and delivery trucks; and
- Reduce pest problems and exposure to pesticides by adopting integrated pest management practices.

It is imperative that all individuals involved in the school environmental health program understand the program goals.

## Develop an Action Plan

School or school district priorities and goals should be captured in an action plan

### SCHOOL HIGHLIGHT:

#### New Hampshire and New York Schools

**New Hampshire:** At the school district level, a diverse committee of key decision-makers, school staff, parents, and local community supporters can be instrumental in sustaining a successful school environmental health program, and foster increased coordination and collaboration on common goals. All schools participating in [New Hampshire's Partners for Healthy Schools](#) program form a committee comprising key school staff (e.g., principals, teachers, nurses, and facilities managers). This committee is in charge of developing work plans for their school and encouraging buy-in at the school level.

**New York:** The Rebuild Schools to Uphold Education Law of 1998 requires all school districts in New York to establish a health and safety committee. Committees should include school administrators, staff, and parents and are responsible for addressing health and safety concerns in occupied school buildings.

that program participants can refer to on a regular basis. In addition to priorities and goals, the action plan should identify:

- The roles, responsibilities, and expectations for program participants;
- Methods for implementing program components (e.g., policies, procedures, practices, and regulations);
- Available resources for program implementation and how the resources will be allocated;
- A timeframe for program implementation; and
- Performance measures for evaluating program success.

A copy of the action plan should be kept in a centrally located place where program participants can easily access it. The plan should be considered a “living document” and be updated regularly to reflect shifting priorities and resources; current policies, practices, and procedures; and changing roles and responsibilities.

## Provide Faculty and Staff Training

Providing training opportunities to school or school district faculty and staff prior to program implementation is crucial for future success. Training can come from a partnership between governmental and non-governmental organizations, from successful peer trainers, or from a trainer with expertise in school environmental health. Trainers should be able to speak from experience and communicate effectively with the audience being trained. Training can be provided in conjunction with other mandatory or recommended training (e.g., Occupational Safety and Health Administration’s 1910.1200 Hazard Communication training or state equivalent). Initial training topics should be

**“An important approach to training maintenance staff is to tell them that they are “key players” in this effort; that they are public health workers involved in making healthy buildings for these students and staff.”**

Connecticut Department  
of Public Health

tailored to a school or school district’s areas of greatest need, and could focus on:

- The purpose of a school environmental health program;
- The components of the program being implemented at the school or school district;
- How the school is complying with federal, state, and local environmental laws and regulations;
- The benefits for students, faculty, and school staff; and
- The policies and procedures currently in place that support the program.

In addition to initial training, school or school district faculty and staff should be encouraged to pursue professional development opportunities that relate to school environmental health issues. Further information on training can be found in the [Faculty and Staff Training](#) section.

## Encourage Student Involvement

The ultimate goal of a school environmental health program is to create safe, healthy, and productive learning environments for children. Enabling student participation throughout program implementation affords students a sense of ownership and accountability in the ultimate success of the program, and provides an opportunity

for unique learning experiences. Student involvement can come in many forms, including:

- Adopting environmental health curricula in relevant courses (e.g., science and health);
- Encouraging high school seniors to incorporate school environmental health topics into senior projects;
- Establishing an environmental/ environmental health club or a related student-led group;
- Offering extra-curricular activities that relate to the environment and environmental health;
- Providing opportunities for students to run public service campaigns (e.g.,

asthma awareness and idling reduction campaigns); and

- Offering volunteer opportunities at the school or in the community that promote environmental stewardship.

Further information on incorporating environmental health in lessons and classroom activities can be found in the [Student Curricula](#) section.

### Promote Program Success

Communicating program success is important for schools and school districts to maintain, and even increase, support for a school environmental health program. Consider using one or more of the following methods to promote program progress and success:

## SCHOOL DISTRICT HIGHLIGHT:

### Carrollton-Farmer's Branch Independent School District in Carrollton, Texas

In April 2002, the Carrollton-Farmer's Branch Independent School District launched the TEAMS (**T**ools for Schools, **E**nergy, **A**sbestos, **M**oisture Management, **S**afety and Security) program as a way to address the management of environmental and safety issues district-wide. TEAMS assembled a comprehensive environmental and safety team, including:

- |  |                              |
|--|------------------------------|
| ★ Executive Director of Facilities Services/Transportation | ★ Health Services Supervisor |
| ★ Director of Maintenance                                  | ★ Custodial Department Head  |
| ★ Director of Security and Operations                      | ★ Athletics Director         |
| ★ Science Coordinator                                      | ★ Construction Supervisor    |
| ★ Occupational Health Nurse                                | ★ Environmental Specialist   |
|  | ★ Nurse Manager              |

In 2011, TEAMS evolved into TIMES (**T**ools for Schools, **E**nergy, **A**sbestos, **M**oisture Management, **S**afety and Security), as asbestos is no longer a significant environmental issue in the district. TEAMS/TIMES has helped the district develop policies and educational tools to ensure students, faculty, school staff, and the community at large have a greater understanding of environmental and safety issues within the school, particularly in the classroom setting.



- Write a success story for the school newsletter or school newspaper.
- Give a presentation at a school board or parent-teacher organization meeting.
- Submit a story for print in the community newspaper.
- Have a booth at a community event highlighting the program and its accomplishments.
- Present an award to school faculty and staff who have contributed to the program's success.
- Apply for national and state awards (e.g., [U.S. Department of Education Green Ribbon Schools Recognition Award](#)).

# How to Use the Model Program

The following model K-12 school environmental health program was developed as a tool for schools and school districts to use in planning specific actions they can take to implement their own school environmental health program. Whether a school or school district is in the planning stages of implementing its first school environmental health program or has a successful program in place, the model program has information and resources to support their efforts.

The model program consists of four sections:

- **Five Key Components of a School Environmental Health Program:** This section discusses five key components of a sustainable school environmental health program and recommends actions schools and school districts can take to address each component

in their program. Schools can use the environmental health priorities that are identified in the program planning process to determine which actions best apply to their situation. Each component offers three tiers of actions a school or school district can take to build a school environmental health program.

It is not uncommon for individual environmental health issues to be addressed through actions under several of the components. Schools should complete the actions that best align with and address their program priorities, and need not tackle all issues at once. Schools and school districts often will find that by taking actions under one component (e.g., Practice Effective Cleaning and Maintenance) they will also be addressing issues relevant to other components (e.g., Prevent Pests and Reduce Pesticide Exposure).

## School Environmental Compliance

Environmental compliance is integral to school environmental health. The actions suggested in the model program are voluntary; however, schools must comply with all applicable environmental regulations. EPA Region 2's [Environmental Compliance and Best Management Practices: Guidance Manual for K-12 Schools](#) is a helpful tool to remind schools of their key environmental requirements. It is important to note that additional, and sometimes more stringent, state and local environmental regulations might also apply to schools.

For additional tools to promote compliance at schools, visit [EPA's Healthy School Environment Resources](#) website. Also, visit the [Campus Environmental Resource Center](#) (Campus ERC). Campus ERC is a library of resources that support campus environmental performance improvement and help visitors better understand environmental regulations. Although Campus ERC is designed for use by colleges and universities, K-12 schools and school districts might find some of its resources helpful.



- **Additional Opportunities for Promoting Environmental Health in School Facilities:** This section presents general information that schools and school districts can use as they plan for and undertake major construction and renovation projects. This section also includes recommendations for improving classroom comfort (e.g., lighting, acoustics, ventilation, and temperature control) and becoming more energy- and water-efficient.
- **Faculty and Staff Training:** This section presents information on training for faculty and school staff that addresses the key components of a school

environmental health program, their roles and responsibilities in the program, and how to make the program sustainable. Training opportunities should be provided in advance of program implementation and address all aspects of the school environmental health program, not just the areas in which the faculty and school staff have expertise and experience.

- **Student Curricula:** This section offers creative ways to incorporate environmental health into lesson plans and classroom activities to engage students in environmental health issues and to show how these issues affect them.

# Five Key Components of a School Environmental Health Program

This section describes the five key components of a school environmental health program; how each component contributes to creating healthy learning environments for children and staff; and introduces some of the actions that schools and school districts can take to implement a school environmental health program.

The components are presented in a three-tiered structure to demonstrate how every school, even those with little or no additional resources, can take some actions to improve school environmental health, and ensure that children and staff have healthier places to learn, work, and play.

- **Tier 1** actions are fixes schools can make immediately, and are a good starting point for schools with little or no previous experience with environmental health programs.
- **Tier 2** actions are essential components of a comprehensive school environmental health program.
- **Tier 3** actions are provided for schools that have established a comprehensive school environmental health program and are looking for ways to enhance their pre-existing program.

## The Five Key Components

 COMPONENT 1	Practice Effective Cleaning and Maintenance
 COMPONENT 2	Prevent Mold and Moisture
 COMPONENT 3	Reduce Chemical and Environmental Contaminant Hazards
 COMPONENT 4	Ensure Good Ventilation
 COMPONENT 5	Prevent Pests and Reduce Pesticide Exposure



## Component 1: Practice Effective Cleaning and Maintenance

### Why Is This Important?

School environments are healthier when they are kept clean and well maintained. Unsanitary conditions attract insects and vermin, and irritants and allergens found in dust and dirt can have a negative impact on student health and performance in schools. Indoor air pollutants and allergens related to poor cleaning practices contribute to increased respiratory and asthma symptoms among children and adults.<sup>1</sup> According to the CDC, asthma is one of the leading causes of school absenteeism, resulting in nearly 14 million missed school days annually nationwide.<sup>2</sup> Regular and thorough cleaning and building maintenance can prevent pest

problems, minimize irritants and allergens, and create healthier learning and working environments for children and staff.

Choosing the right cleaning products and practices is critical for maintaining a healthy school environment and protecting the health of children and staff. The chemicals found in some cleaning products can cause health problems, including eye, nose, and throat irritation and headaches, and in some cases can trigger asthma attacks. Using green cleaning products and practices can help to avoid these health effects, improve indoor air quality, and increase the lifespan of facilities.

Maintaining the school facility is just as important as routine cleaning to ensure a healthy environment for children and staff. A regular inspection program can identify problems before they impact the school environment and the occupants' health. School building maintenance protocols should address the entire building infrastructure: the foundation, exterior and interior walls, windows and doors, and roofing.<sup>3</sup>

### Green Cleaning

Green cleaning means using cleaning products and practices that pose less harm to human health and the environment. Green cleaning products have one or more of the following traits:

- ★ low or no volatile organic compound (VOC) emissions,
- ★ neutral pH levels,
- ★ no known carcinogens, and
- ★ are biodegradable.

For more information on green cleaning in schools, see EPA's [Safe Chemical Management in Schools green cleaning fact sheet](#).

### Actions Schools Can Take to Practice Effective Cleaning and Maintenance

#### Review Existing State Policy

Many states have implemented policies to promote healthy school environments. Refer to and follow your state's relevant environmental health policies and emergency management protocols when conducting cleaning and maintenance

## Healthy Schools Green Cleaning Resources

Valuable green cleaning resources are widely available for use by schools and concerned stakeholders.

Green Clean Schools is the Healthy Schools Campaign's national partnership to promote green cleaning in schools. The initiative brings together the cleaning industry, educational leaders, parents, and advocates to support schools in adopting environmentally friendly policies, practices, and products. The partnership provides important resources, tools, and success stories to help schools adopt environmentally friendly cleaning policies and practices. To learn more and view webinars, visit the [Healthy Schools Campaign Green Clean Schools](#) website.

The Healthy Schools Network's [Cleaning for Healthy Schools Toolkit](#) provides valuable information on green cleaning, including background on the costs and benefits of green cleaning, model state green cleaning policies, links to certified green cleaning products, and online workshops on green cleaning practices.

activities. (States may insert relevant environmental health policies and emergency management protocols here.)

### Tier 1: Simple Steps Schools Can Take to Get Started

The best way to launch a school environmental health program is to identify fixes and solutions that can be implemented immediately. Schools should start by asking questions like, where are the school's areas of greatest need and what resources are available to address those needs? The answers to these questions will help schools decide where to focus their initial efforts.

Review the school's current cleaning and maintenance practices and verify the following actions are routinely taken:

- For cleaning:
  - Schedule routine cleaning when the building is unoccupied.
  - Read and follow product labels.
  - Use only the amount of product suggested on the label.
  - Use proper equipment to perform cleaning tasks.
- Ensure cleaning products are inaccessible to students.
- Maintain an up-to-date inventory of all cleaning products used.
- Keep copies of Safety Data Sheets (SDSs) for all cleaning products in an accessible location.
- Clean and remove dust from hard, impermeable surfaces with a water-dampened cloth.
- Wipe up paint chips with a wet sponge or rag.
- Vacuum using high-efficiency vacuums and filters (e.g., high efficiency particulate air filters).
- Ensure garbage is stored in appropriate containers and disposed of properly at the end of each day.
- Purchase and use walk-off mats at building entrances to reduce the amount of dust and soil tracked into school buildings.
- Conduct thorough cleaning of kitchens, cafeterias, and other food use areas.

- Reduce clutter, such as excess paper or plush toys, which collect dust and allergens and prevent thorough cleaning.
- For maintenance:
  - Caulk all windows and door frames, and seal any joints.
  - Monitor the interior of the roof for water damage.
  - Inspect windows and doors for physical damage and improper seals.
  - Ensure all windows and doors are functioning properly.
  - Check weather-stripping and replace as needed.
  - Inspect the foundation for cracks, decay, and water infiltration.
  - Inspect exterior plywood for cracks, decay, and water damage.
  - Cut back overgrown vegetation near exterior walls.
  - Inspect ceilings and duct work for deteriorating tiles and heating, ventilation, and air conditioning (HVAC) lining, as well as loose insulation.

### **Tier 2: Key Elements for a Comprehensive School Environmental Health Program**

Schools that have completed most of the actions listed under Tier 1 will be prepared to implement the key elements necessary for a more comprehensive school environmental health program.

- Establish a green cleaning and preventive maintenance plan for your school.
  - Involve teachers, administrators, purchasing officials, and custodians in designing and implementing the plan.
  - Select cleaning products with positive environmental attributes (i.e., low or no volatile organic compound (VOC) emissions, no potential carcinogens) recognized by third-party eco-certification programs, including EPA's [Design for the Environment, Green Seal](#) and [Ecologo](#). Further information on selecting green cleaning products can be found in [Appendix C: Additional Information and Resources](#).
  - When purchasing neutral cleaners, glass cleaners, bathroom cleaners, and disinfectants, consider products that

### **SCHOOL DISTRICT HIGHLIGHT: Northeast Independent School District in San Antonio, Texas**

The maintenance department for the Northeast Independent School District facilities used the IAQ Tools for Schools Framework to centralize its custodial services and adopt a “Going Green” initiative. The school district’s “Going Green” efforts have included implementing standard cleaning protocols across the district, selecting [Green Seal](#) certified products whenever available, and performing monthly campus inspections and assessments. Since adopting the initiative, the Northeast Independent School District has reduced chemical costs by 19% and has been recognized for their green cleaning efforts.



have high dilution rates, are designed to reduce waste, and have lower end-use costs.

- Avoid using cleaning products containing fragrances that might trigger asthma symptoms, or those with strong odors.
- Involve facilities and custodial staff in the selection and testing of cleaning products.
- Educate facilities and custodial staff on the attributes and health benefits of greener products to encourage adoption and sustained use.
- Incorporate green cleaning concepts and practices into your preventive maintenance plan. For example:
  - Spray cleaning cloths with product rather than the surface to be cleaned;
  - Use microfiber cleaning cloths and other tools to minimize the amount of cleaning products used; and
  - Purchase products as concentrates and dilute on site.
- Train facilities and custodial staff on cleaning practices and policies, as well as procedures for handling a chemical spill.
- Conduct an inventory of cleaning products. Identify and properly dispose of products that are outdated, unknown, or not needed.
- Maintain a standardized list of approved and disapproved cleaning products at the school district level. Such a list will ensure all schools in the district use the same cleaning products and techniques and are cleaned to the same standard.
  - Prohibit teachers and school staff from bringing in cleaning chemicals and products that have not been approved for district and school building use.
- Annually assess and remove items that are stored in schools and are no longer needed. Such items could include old lesson plans and materials, outdated or unneeded school supplies, and outdated or worn electronic equipment and furniture.

- Use EPA's [IAQ Tools for Schools Action Kit](#) checklists to assist with routine school building inspections and maintenance.
- Schedule an annual inspection of the school facilities by a building professional.
- Inspect roofs at least twice a year, including a pre-winter inspection in October or November.
- Maintain accurate records of roof and building inspections.

### Tier 3: Enhance a School's Pre-Existing Program

Schools that have taken steps to implement a comprehensive school environmental health program can build on their pre-existing programs by considering the following actions:

- Develop and record measures specific to the school that will demonstrate improvement in adopting healthier cleaning and maintenance practices. For example:
  - Number of green cleaning products piloted;

- Number of training workshops held and number of participants;
- Pounds of toxic chemicals avoided by switching to more environmentally friendly, less toxic cleaning products; and
- Number of nurse visits due to symptoms associated with exposure to cleaning products (e.g., eye, nose, and throat irritation, headaches, and asthma attacks).<sup>a</sup>
- Consider purchasing building materials that easily can be cleaned and maintained with the same cleaning products used throughout the school building.
- Incorporate information and updates on healthier cleaning into newsletters, school announcements, and other outreach material.

<sup>a</sup> When collecting such data, schools and school districts might have to consider and respond to human subject review protocols (e.g., state institutional review board).





## Component 2: Prevent Mold and Moisture

### Why Is This Important?

The key to mold control is moisture control. Keeping the school environment dry is essential for maintaining a healthy school building, as well as promoting an environment conducive to learning and working. The presence of moisture within building structures stimulates the growth of molds and other biological contaminants, and damp schools provide a nurturing environment for mites, roaches, and rodents, which are associated with asthma, allergies, and other respiratory diseases. Moisture and mold can also damage building infrastructure and result in costly renovations. Individual school districts have incurred costs from \$200,000 to as much as \$13 million for remediating mold and mildew damage.<sup>4,5,6,7,8</sup> A few hundred dollars of annual preventive maintenance can avoid the need for costly mold remediation, as well as the potential legal liability posed by the presence of mold and mildew and its health risk for children and staff.<sup>4</sup>

### Actions Schools Can Take to Prevent Mold and Moisture

#### Review Existing State Policy

Many states have implemented policies to promote healthy school environments. Refer to and follow your state's relevant environmental health policies and emergency management protocols when conducting preventive mold and moisture activities. (States may insert relevant environmental health policies and emergency management protocols here.)

#### Tier 1: Simple Steps Schools Can Take to Get Started

The best way to launch a school environmental health program is to identify fixes and solutions that can be implemented immediately. Schools should start by asking questions like, where are the school's areas of greatest need and what resources are available to address those needs? The

### The Cost of Mold in Schools

Willingboro High School in Willingboro, Pennsylvania spent approximately \$943,692 to address mold found in the school. Remediation activities included air quality testing, duct cleaning, repairs to the HVAC system, replacement of ceiling tiles, and textbook cleaning.<sup>9</sup>

Cecil S. Collins Elementary School in Barnegat, New Jersey spent \$700,000 to pay for mold remediation activities, including removal and repairs.<sup>10</sup>

Middle Township Elementary School No. 1 in New Jersey spent more than \$112,400 in mold cleanup costs and \$10,000 for air quality and surface testing.<sup>11</sup>

answers to these questions will help schools decide where to focus their initial efforts.

Conduct an initial inspection of the school environment. Identify immediate actions that can be taken for:

- Preventing moisture/mold in schools
  - Conduct routine moisture inspections to ensure the school building is free of moisture problems, water damage, and visible mold on all interior surfaces.
  - Fix leaking plumbing and leaks in the school building and roof as soon as possible.
  - Watch for condensation and wet spots. Address sources of moisture problems promptly.
  - Dry wet areas within 24–48 hours.
  - Vent moisture-generating appliances (e.g., dryers) to the outside.
  - Ensure carpeting is not installed in areas with exposed plumbing.
  - Maintaining gutters, downspouts, scuppers, and storm drains
  - Downspouts, scuppers, and storm drains should be intact and properly connected.
  - Downspouts should drain to the storm sewer or a visibly sloped grade away from the school building.

- Downspouts, scuppers, and storm drains should have no evidence of stormwater overflow or obstruction.
- Gutters, downspouts, scuppers, and storm drains should be free of excessive debris.
- Gutters and roofs should have no standing water.
- Consult EPA's [Mold Remediation in Schools and Commercial Buildings](#) website for mold cleanup guidance and procedures.

### **Tier 2: Key Elements for a Comprehensive School Environmental Health Program**

Schools that have completed most of the actions listed under Tier 1 will be prepared to implement the key elements necessary for a more comprehensive school environmental health program.

- Preventing moisture/mold in schools
  - Establish a mold prevention and remediation plan.
  - Ensure ventilation systems are circulating the indoor air properly. See [Component 4: Ensure Good Ventilation](#) for more information.
  - Maintain indoor humidity levels between 30% and 60%.

## **SCHOOL DISTRICT HIGHLIGHT: Broward County, Florida Public Schools**

Prior to 2002, Broward County Public Schools did not have an integrated system to manage its indoor air quality. But when a building audit revealed that seven elementary schools had moisture problems, the district knew it needed to act quickly to protect the buildings and their occupants. School district officials turned to EPA's IAQ Tools for Schools program to address the immediate issues, and then develop a comprehensive, integrated approach to proactively manage indoor environments and indoor environmental health.



- Ensure indoor pool facilities are well ventilated to control humidity levels.
- Clean carpets with extraction cleaners to remove water and prevent mold growth.
- Take steps to prevent water from ponding within 10 feet of the school building foundation (e.g., irrigation water spray lines should not be within 3 feet of the school building's foundation).
- Know what steps to take in the event of a flood. EPA's [Flood Cleanup](#) website has information on cleaning up after a flood and how to prevent mold and moisture problems.
- Develop and record measures specific to the school that will demonstrate improvement in adopting effective moisture management techniques. Examples include:
  - Reduction in the number of mold findings within the school facilities.
  - Reduction in the number of cleaning/remediation events due to mold growth.
- Purchase furniture and carpeting made from mold-resistant materials when replacing worn or damaged items.
- Install vents to the outside for all areas in the school building that use large quantities of water (e.g., kitchens, bathrooms, locker rooms, and pool facilities).
- Integrate information on mold into the student curricula.
- Incorporate information and updates on mold and moisture management into newsletters, school announcements, and other outreach material.

### **Tier 3: Enhance a School's Pre-Existing Program**

Schools that have taken steps to implement a comprehensive school environmental health program can build on their pre-existing programs by considering the following actions:



## Component 3: Reduce Chemical and Environmental Contaminant Hazards

### Why Is This Important?

Schools need to provide a safe and healthy learning environment for children by preventing exposure to chemicals and environmental contaminants that pose health risks to them and the environment. Children spend a significant portion of their time in school and might be more vulnerable to chemical and environmental contaminant hazards than adults because:

- Their bodily systems are still developing;
- They eat more, drink more, and breathe more in proportion to their body size than adults; and
- Their behaviors can significantly increase their exposures to chemicals and potentially harmful organisms.

### Chemicals and Chemical-containing Products

Schools use chemicals in classrooms, science laboratories, art studios, vocational education shops, and facility maintenance. Many of these chemicals are toxic to humans, animals, and the environment and should be purchased, used, handled, and disposed of in a manner that protects students and school staff from accidents and risk of exposure. Toxic chemicals can cause serious health effects, including cancer; brain and nervous system disorders; organ damage (i.e., liver, kidneys, and lungs); irritation of the eyes, skin, nose, and throat; and asthma attacks.<sup>12</sup>

For example, mercury is a known neurotoxicant and is used in many items found throughout schools, such

as thermometers, barometers, switches, thermostats, fluorescent lamps, and laboratory reagents. The most common form of mercury found in schools is elemental mercury, and exposure primarily occurs when elemental mercury is spilled or when a product containing elemental mercury breaks and the mercury is exposed to the air. Symptoms of elemental mercury exposure include tremors, irritability, mood swings, insomnia, muscle weakness or atrophy, headaches, and performance deficits on tests of cognitive function.<sup>13</sup> Higher exposures to elemental mercury can result in kidney effects, respiratory failure, and death.<sup>13</sup>

Another group of chemicals of concern for schools are polychlorinated biphenyls (PCBs). PCBs are found in a variety of building products, including fluorescent light ballasts, which were installed in schools built before 1979. Congress banned the manufacturing and use of PCBs in 1976 and EPA phased out their use, with some exceptions, in 1979. Many of the fluorescent light ballasts that were installed before the ban, however, could contain PCBs and might still be used in schools. PCBs are highly toxic and high levels of exposure might cause cancer and neurodevelopmental effects in humans. Although intact PCB-containing light ballasts might not pose an immediate health threat, failing or leaking fluorescent light ballasts in schools could result in unsafe levels of PCBs in the air children breathe over the long-term.

Lead-based paint is an additional concern for schools, especially those built prior to 1978. Lead exposure affects the nervous system and can cause a range of health effects, from behavioral problems and learning disabilities, to seizures and death. Lead-based paint and lead contaminated dust are the main sources of lead exposure in U.S. children. Intact lead-based paint might not pose a hazard, but paint that flakes or becomes dust could result in unsafe levels of this dangerous chemical in the school environment.

### Radon

Radon is a colorless, odorless, tasteless radioactive gas that occurs naturally in almost all soil and rock. Radon is found in outdoor air and can enter schools through cracks or other openings in the foundation. Exposure to radon is the second leading cause of lung cancer after smoking.<sup>14</sup> Although there is no evidence that children are at greater risk of lung cancer from radon exposure than adults, EPA recommends that schools test frequently occupied rooms at or below ground level for radon.

## School Environmental Compliance

EPA regulates many chemicals found in buildings, such as asbestos, lead, PCBs and mercury. EPA Region 2's [Environmental Compliance and Best Management Practices: Guidance Manual for K-12 Schools](#) is a helpful tool to remind schools of their key environmental requirements. It is important to note that additional, and sometimes more stringent, state and local environmental regulations might also apply to schools.

### Drinking Water

Ensuring safe drinking water in schools is important because children and staff might consume a significant amount of their daily water intake in schools.<sup>15</sup> Aging, leaded plumbing systems and leaking pipes can lead to contamination of a school's drinking water supply. Improperly maintained water systems can also harm the environment



and have financial implications (e.g., higher water bills). Leaking pipes lead to water loss, which can promote mold growth and be very costly for a school to remediate.<sup>15</sup>

### Outdoor Air Pollution

Schools should carefully consider the potential health threats due to outdoor air pollution when planning outdoor activities for children and when establishing school transportation policies.

### Diesel Emissions

Bus and truck idling at schools can produce concentrated diesel exhaust emissions both inside and outside school buildings. Diesel exhaust contains fine particulate matter that, when inhaled, can cause lung damage and aggravate pre-existing respiratory conditions, such as asthma.<sup>16</sup> Diesel particulate matter has also been identified as a likely cause of cancer.<sup>16</sup> The soot and gases emitted by diesel engines are associated with acute eye, throat, and bronchial irritation; exacerbation of asthma and allergies; and potential interference with

lung development in children.<sup>16</sup> In addition to impacting human health, diesel exhaust also harms the environment by contributing to smog formation and acid rain.

### Ozone, Particle Pollution, and Air Toxics

Ground level ozone and particle pollution are the two air pollutants that pose the greatest threat to human health in the United States. Ozone, the primary component of smog, can cause throat irritation, coughing, chest tightness, shortness of breath, and aggravated asthma symptoms.<sup>17</sup> Particle pollution, or particulate matter, can embed deep within the lungs and cause serious health problems, especially for those with respiratory conditions. Even healthy individuals can experience temporary symptoms from exposure to particle pollution, including irritation of the eyes, nose, and throat; coughing; phlegm; chest tightness; and shortness of breath.

Hazardous air pollutants (HAPs), or air toxics, are pollutants that are known or

## SCHOOL HIGHLIGHT: Ballou High School, Washington DC

On October 2, 2003, the Washington DC Fire Department Hazmat Unit responded to an emergency call from Ballou High School. A student had obtained 250 milliliters (or 1 cup) of elemental mercury from a science laboratory and had sold some of it to other students. This incident led to an exhaustive mercury spill clean-up.

Contamination did not stop at the school. Students unknowingly carried mercury on shoes and clothing through the streets, onto city and school buses, and into their homes. Eleven homes and one common area were found to be contaminated and about 16 families were displaced from their homes for a month.

As a result of the mercury spill, Ballou High School was closed for 35 days and more than 200 homes were tested for mercury contamination. Total cleanup costs were about \$1,500,000.

Learn more about proper [mercury management, and the cost of mismanaging mercury, in schools](#).

suspected to cause cancer, respiratory effects, reproductive effects, and birth defects. The Clean Air Act lists 187 HAPs, 33 of which EPA has identified as posing the greatest threat to public health and the environment. Of those 33, 13 are mobile source air toxics, which are emitted from vehicles. Excessive idling by school buses, passenger vehicles, and delivery trucks can cause elevated levels of air toxics in and around the school.

### Secondhand Smoke

Breathing secondhand smoke can be harmful to children's health. Children's exposure to secondhand smoke is responsible for increases in the number of asthma attacks and severity of symptoms in 200,000 to 1 million children with asthma, and respiratory tract infections resulting in 7,500 to 15,000 hospitalizations each year.<sup>18</sup> The developing lungs of young children are severely affected by exposure to secondhand smoke for several reasons: Children are still developing physically; they have higher breathing rates than adults; and they have little control over their indoor environments. Children receiving high doses of secondhand smoke are at the greatest risk of experiencing damaging health effects.<sup>18</sup>

## Actions Schools Can Take to Reduce Chemical and Environmental Contaminant Hazards

### Review Existing State Policy

Many states have implemented policies to promote healthy school environments. Refer to and follow your state's relevant environmental health policies and emergency management protocols when performing chemical and environmental contaminant management activities. (States may insert relevant environmental health policies and emergency management protocols here.)

### Tier 1: Simple Steps Schools Can Take to Get Started

The best way to launch a school environmental health program is to identify fixes and solutions that can be implemented immediately. Schools should start by asking questions like, where are the school's areas of greatest need and what resources are available to address those needs? The answers to these questions will help schools decide where to focus their initial efforts.

### Chemicals and Chemical-containing Products

- Conduct a chemical inventory of the school, or locate and review an existing inventory.
  - Compare the chemical inventory to the school district's approved chemicals list, if available. Chemicals not on the school district's list should be marked for removal. King County, Washington's [School Chemical List](#) is another excellent resource to identify appropriate chemicals to use in schools, as is the Consumer Product Safety Commission/National Institute for Occupational Safety and Health [School Chemistry Laboratory Guide](#).
  - Update the school chemical inventory if it is more than a year old.
  - Ensure the school has up-to-date SDSs for all chemicals and chemical products.
- Where applicable, perform screenings and inspections of chemical-containing equipment (e.g., PCB fluorescent lighting ballasts, mercury-containing items) to ensure the equipment is properly managed. Develop chemical equipment inventory lists, as needed.
  - Inspect the school's fluorescent light ballasts for leaking PCBs.
    - Ballasts manufactured through 1979 could contain PCBs, and ballasts

manufactured between 1979 and 1998 that do not contain PCBs should be labeled, "No PCBs." If the light ballast does not contain this label, assume it has PCBs.

- If a light ballast is found to be leaking PCBs, federal law requires the immediate removal and disposal of the light ballast and disposal of any PCB-contaminated materials at an EPA-approved facility.
- Consult EPA's [Proper Maintenance, Removal, and Disposal of PCB-Containing Fluorescent Light Ballasts](#) website for more information on inspecting and replacing fluorescent light ballasts.
- If the school was built before 1978, lead-based paint might be present on coated surfaces. If applicable, develop a list of rooms and areas that contain, or might contain, lead-based paint.
- Visually inspect chemical storage areas. Are the chemicals:
  - Clearly labeled?
  - In undamaged containers?
  - Outdated?
  - In a designated storeroom or cabinet with operable locks?
  - Stored according to chemically compatible families?
  - Stored on appropriate shelving (e.g., shelving that is stable and not deteriorating)?
  - Appropriate for the grade level being taught? For specific recommendations, see King County, Washington's [School Chemical List](#).
- Review the school's mercury inventory list.
  - If the school does not have an up-to-date mercury inventory, identify and catalog all elemental mercury, mercury

compounds, mercury solutions, and mercury-containing devices at the school.

- Common mercury-containing items found in schools include thermometers, barometers, switches, thermostats, flow meters, lighting (linear fluorescent and compact fluorescent lamps), and laboratory reagents.
- Review the school's chemical hygiene plan.
  - Does the plan have a chemical spill control policy?
  - Does the plan include staff training requirements for chemical management, including purchasing, use, storage, and addressing spills?
  - Does the plan identify contact information for the local authorities responsible for managing chemical spills?
  - If the chemical hygiene plan does not address one or more of these topics or if a chemical hygiene plan does not exist, take steps to develop these policies and procedures. Local and state environment and health departments can be good places to start.
- Review the school's hazard communication plan. The plan should contain the following information:
  - Contact information for the person responsible for implementing the plan;
  - Procedures for acquiring, maintaining, and providing access to SDSs;
  - An updated chemical inventory;
  - Provisions for employee training; and
  - Chemical labeling requirements.
- Encourage teachers to use school and art supplies that do not contain toxic chemicals or other contaminants (e.g., lead), and develop a screening process or protocol for accepting donated supplies.

- Ensure faculty and staff are aware of EPA's [Academic Laboratories Rule](#), specifically to increase awareness of hazardous waste management and proper chemical disposal procedures.

### Radon

- Test frequently occupied rooms at or below ground level for radon. Radon levels should be lower than EPA's action level of 4 picocuries per liter (pCi/L) in air. Guidance for radon testing and mitigation can be found in [Appendix G: Radon](#) of the IAQ Reference Guide in the IAQ Tools for Schools Action Kit.

### Drinking Water

- Determine whether the school is a public water system (PWS). A PWS is a system that serves water to 25 or more of the same people more than 60 days per year, or a system that has 15 or more service connections. Most schools are usually part of a larger PWS but smaller schools in rural areas can be their own PWS.
- If a school is a PWS, it must:
  - Comply with all primary drinking water regulations and applicable underground injection control requirements;
  - Notify students, staff, and parents if the system fails to meet primary drinking water standards;
  - Ensure that only lead-free pipes are used in either installation or for repairs; and
  - Comply with all state program requirements and EPA inspections.
- If the school has its own water supply system, check with the system operator to ensure that the system is in compliance with drinking water regulations.
- Review the school's files for plumbing surveys that identify areas of high risk

for lead sources. If these records do not exist, or if significant plumbing modifications have been made since the last survey, conduct a plumbing survey as soon as possible. For help conducting a plumbing survey, see EPA's [3Ts for Reducing Lead in Drinking Water](#) manual.

- Maintain drinking water taps by routinely cleaning faucet aerators and disinfecting drinking water outlets and water fountains.
- Compare the school's drinking fountains with those identified on [EPA's list of known lead-containing models](#). Make note of any fountains that are on EPA's list and take them out of service.
- Review the school's files on lead test results for drinking water taps. If testing records do not exist, or if testing has not been conducted within the past 5 years, collect and analyze samples from drinking water taps. EPA's Lead in Drinking Water website provides [guidance on conducting lead testing in schools](#).
- Lead concentrations at all drinking water taps should be below 20 parts per billion (ppb) for a 250-milliliter sample. This concentration applies only for schools whose water supply is provided by a municipal system (i.e., a PWS). For schools that have their own well or water source, lead concentrations at 10% of drinking water taps must be below the EPA action level of 15 ppb. These schools must test for lead and be below the lead action level to comply with the [National Primary Drinking Water Regulations](#).

### Outdoor Air Pollution

- Review the current school bus schedules. Are they designed to minimize bus idling? If not, work with the appropriate personnel to revise the bus schedules accordingly.

- Identify the location of all school air handler intake vents. Ensure that intake vents are located away from high vehicular traffic areas (e.g., areas designated for student drop-off and pick-up) and chimneys for school heating systems. If intake vents cannot be moved, direct traffic away from the vent locations, relocate student drop-off and pick-up areas, or cone off the areas during high vehicular traffic times.
- Keep classroom windows closed during periods of high vehicular traffic (e.g., before/after school and during rush hour if the school is located near a main street or highway), or on days when smog or pollen counts are high.
- Implement an [idling reduction campaign](#) at the school to eliminate unnecessary vehicle idling.
- Locate the school's procedures for responding to [Air Quality Index](#) advisories. If your school does not have procedures in place, or if the procedures are not up-to-date, take steps to develop or improve these procedures. For an example set of procedures, view those developed for the [Northeast Independent School District](#) in San Antonio, Texas. Further information can be located in [Appendix C: Additional Information and Resources](#).

### Secondhand Smoke

- Institute a smoke-free policy for the school campus.

### Tier 2: Key Elements for a Comprehensive School Environmental Health Program

Schools that have completed most of the actions listed under Tier 1 will be prepared to implement the key elements necessary for a more comprehensive school environmental health program.

### Chemicals and Chemical-containing Products

- Form a chemical management team at the school.
  - Team members should have direct involvement with or knowledge of chemical management at the school, from the purchase of chemicals to their ultimate disposal.
- Conduct annual chemical inventories to ensure all unused, unneeded, and unknown chemicals are identified and disposed of properly.
- Develop a responsible chemical management program for the school or school district to ensure chemicals are stored, labeled, used, and disposed of properly. EPA's [Safe Chemical Management in K-12 Schools Tool Kit](#) has resources to help schools and school districts get started.
- Institute a chemical purchasing policy at the school.
  - All chemicals and chemical-containing products should be reviewed and purchased through one person or a team responsible for vetting chemicals for excessively hazardous products (e.g., carcinogens, mutagens, and asthmagens).
  - Purchase no more than a 5-year supply of chemicals, and do not reorder until necessary to prevent accumulation.
  - Choose chemicals and chemical products using the safest possible ingredients. Consult EPA's Design for the Environment's list of products meeting their safer ingredient criteria.
  - Consult with state green procurement initiatives to determine if safer, third-party certified chemicals and chemical products are available on state contracts.

## Checklist for Lead Hazards

Pay attention to the following when inspecting for lead-based paint:

- ★ **Interior painted areas** – Examine walls and interior surfaces to see if the paint is cracking, chipping, or peeling, and check for areas on doors or windows where painted surfaces rub together.
- ★ **Exterior painted areas** – Check exterior paint, which can flake off and contaminate nearby soil where children might play.
- ★ **Surrounding areas** – Be aware of large, nearby structures with peeling or flaking paint that could contaminate the soil around play areas.
- ★ **Play areas** – Examine areas where children play to ensure they are dust free and clean. Outside, check for bare soil and test for lead.
- ★ **Playground equipment** – Check older equipment to determine whether it contains lead-based paint.
- ★ **Painted toys and furniture** – Make sure the paint is not cracking, chipping, or peeling.

- Prohibit teachers and school staff from bringing in chemicals, chemical products, and art supplies that are unauthorized or contain toxic ingredients.
- Prohibit the purchase of mercury products.
- Ensure teachers and staff receive chemical management training as mandated under the Occupational Safety and Health Administration's [laboratory safety standard](#).
- Ensure students understand proper chemical management. For example:
  - Have students take a laboratory safety test before performing experiments in the classroom. The test should cover topics such as laboratory rules and regulations, as well as proper handling, storage, and disposal of chemicals and chemical products, especially those that pose specific hazards (i.e., corrosive, reactive, and flammable chemicals). Students that fail the test cannot work in the laboratory until they successfully pass the test.
  - Establish a formal three-way contract between students, parents, and teachers/administrators that establishes appropriate behavior when using chemicals.
- Conduct a chemical cleanout.
  - Use the school's chemical inventory to identify unused, unneeded, degraded, and unknown chemicals.
  - Remove chemicals from the school with the help of a qualified and experienced professional. EPA's [Safe Chemical Management in Schools Workbook](#) provides guidance on procuring professional chemical removal assistance.
  - Ensure the following chemicals are removed from the art department: hexane- and toluene-based aerosols, ceramic glazes containing lead or cadmium, and all fluoride-based glass etchants.
  - Remove or replace all excess, outdated, and unneeded mercury-containing products with alternatives containing

no mercury. Ensure mercury is recycled or disposed of in accordance with federal, state, and local regulations.

### Radon

- Track radon test results, assessment data, and pending actions so that facility maintenance personnel can plan accordingly.
- Retest routinely if schools were mitigated to ensure radon mitigation systems are functioning properly.

### Drinking Water

- Test the school's drinking water for contaminants. Testing requirements and timing will differ depending on the number of people being served and where the school gets its water (groundwater vs. surface water).
- If testing shows that contaminants have entered the system and their levels are above the regulatory minimum, the school will need to take action. For more information on contaminants and taking action, refer to EPA's website on [current drinking water regulations](#).
- Schools should have a plan for providing drinking water to students if testing uncovers contaminants in the school's drinking water supply.
- If the school's drinking water lead concentrations exceed EPA's action level, take steps to develop a plan to reduce lead levels at all taps that do not meet the 20 ppb (municipal system)/15 ppb (well) standard. Plans might include:
  - Testing for lead on a regular basis;
  - Instituting a flushing program;
  - Clearing debris from outlet screens and aerators on a routine basis;
  - Replacing pipes, solder, and fixtures if they are known to be sources of lead; and

## Drinking Water in Schools and Childcare Facilities

EPA is responsible for ensuring the safety of the nation's drinking water in public water supplies. EPA estimates that approximately 10,000 schools and child care facilities maintain their own water supply and are regulated under the Safe Drinking Water Act. In addition, approximately 90,000 public elementary and secondary schools<sup>19</sup> and an estimated 500,000 licensed child care facilities in the nation<sup>20</sup> are not regulated under the Safe Water Drinking Act and might or might not be conducting voluntary drinking water quality testing. Whether your facility is a regulated or non-regulated school or child care center, you can find information about drinking water quality on [EPA's Drinking Water in Schools and Child Care Facilities](#) website.

- Disabling taps to prevent water consumption from that tap. Schools should implement identified actions in the lead reduction plan according to priority and resources available. Further information to assist plan development and implementation can be found on [EPA's Guidance and Tools for Drinking Water in Schools and Child Care Facilities](#) website.
- Develop a plan for, and conduct routine maintenance of, the school's drinking water infrastructure.
- If the school acquires its drinking water from its own well, conduct source water assessments and identify any

surrounding activities or sources that might have an adverse effect on water quality.

- Inspect water pipes for leaks and corrosion. Leaking or corroded pipes can introduce contaminants into the drinking water system and contribute significantly to water loss and mold growth.
- Replace drinking fountains identified on [EPA's list of known lead-containing models](#) with fountains that do not contain lead.
- A school might or might not be connected to a public wastewater system. Schools with their own wastewater management system (e.g., septic system) will need to inspect and pump their system regularly to prevent back-ups into the school. See EPA's website on [Wastewater Management](#) for guidance and more information.

### Outdoor Air Pollution

- Implement an anti-idling policy for school buses, passenger vehicles, and delivery trucks, and post signs stating all vehicles are prohibited from idling on school premises.

### Secondhand Smoke

- Implement a smoking education program for students that covers the social and physiological consequences of tobacco use, information about social influences (e.g., peers, parents, and media), and training on how to manage peer pressure to smoke.

### Tier 3: Enhance a School's Pre-Existing Program

Schools that have taken steps to implement a comprehensive school environmental health program can build on their pre-existing program(s) by considering the following:

### Chemicals and Chemical-containing Products

- Implement green curricula in the classroom. [EPA's Safe Chemical Management in Schools Workbook](#) includes a section on putting together and starting a green curriculum in the classroom.

### Radon

- Schedule re-testing following all major renovations, and consider how HVAC modifications or upgrades might affect radon intrusion.

### Drinking Water

- Develop and record measures specific to the school that will demonstrate improvement in drinking water quality.
- Involve students in drinking water testing. A teacher or facility manager should ensure testing is completed according to established procedures to obtain meaningful results. This activity can be integrated into science and mathematics courses, as well as senior projects.

## The Reduction of Lead in Drinking Water Act

In January 2011, the Reduction of Lead in Drinking Water Act was passed to reduce the amount of lead allowed in "lead-free" plumbing materials from 8% to 0.25%. The new standard is modeled after a California law that went into effect on January 1, 2010. The Reduction of Lead in Drinking Water Act will become fully effective in January 2014, but some manufacturers are already making products according to the new standard. When replacing plumbing fixtures, make sure new fixtures are in line with the new definition of lead-free and are NSF International certified to reduce lead.

### Outdoor Air Pollution

- Have students observe vehicle idling behavior before and after implementing an anti-idling policy. Have students calculate exhaust emissions generated before and after an anti-idling policy is implemented using widely available web-based calculators.
- If funding allows, retrofit your current school bus fleet with improved emission control technologies, or replace older school buses with newer, more fuel-efficient, and less-polluting buses. Visit

EPA's [National Clean Diesel Campaign](#) website for more information.

- Participate in the [School Flag Program](#) to help the school and its surrounding community know the daily air quality conditions. Schools in the flag program raise a brightly colored flag each day that corresponds to the air quality forecast. Based on the color of the flag (green, yellow, orange, or red), teachers and coaches can modify outdoor activities when the air quality is unhealthy.





## Component 4: Ensure Good Ventilation

### Why Is This Important?

Indoor air pollution has been demonstrated to have an adverse impact on public health. Poor indoor air quality can cause short- and long-term health problems such as coughing, eye irritation, headaches, asthma episodes, allergic reactions, and in rare cases, life-threatening conditions such as respiratory distress. Improperly managed ventilation and filtration systems can contribute to airborne mold, infectious diseases, and carbon monoxide poisoning. Poor indoor air quality can also impact the comfort and health of children and staff, which can in turn affect concentration, attendance, and classroom performance.

Good indoor air quality can help ensure a healthier and higher performance learning environment for students and school staff, and proper maintenance of ventilation and filtration equipment plays a big role in the quality of the indoor air. Adequate ventilation with outdoor air is a key component for good indoor air quality in schools and classrooms, and can contribute to mitigating the effects of radon and vapor intrusion. Furthermore, well-maintained air filtration systems capture and remove airborne particles that can be asthma triggers, allergens, and infectious or toxic to humans.

Indoor air can be two to five times more polluted than outdoor air and large populations of children might be more susceptible to indoor pollutants than the general population. The high occupant densities of schools and classrooms makes it particularly important for building designers to incorporate

ventilation systems that provide adequate outdoor air (in compliance with the industry's ventilation standard, [American Society of Heating, Refrigerating, and Air Conditioning Engineers \(ASHRAE\) 62.1-2010](#), control moisture, and minimize energy costs.

### Actions Schools Can Take to Ensure Good Ventilation

#### Review Existing State Policy

Many states have implemented policies to promote healthy school environments. Refer to and follow your state's relevant environmental health policies and emergency management protocols when conducting ventilation and filtration maintenance activities. (States may insert relevant environmental health policies and emergency management protocols here.)

#### Tier 1: Simple Steps Schools Can Take to Get Started

The best way to launch a school environmental health program is to identify fixes and solutions that can be implemented immediately. Schools should start by asking questions like, where are the school's areas of greatest need and what resources are available to address those needs? The answers to these questions will help schools decide where to focus their initial efforts.

Having a balanced HVAC system is crucial for regulating temperature and providing adequate ventilation. Conduct an initial inspection of the school's HVAC system and ensure the following actions are routinely taken:

- Ensure the school building has a functioning ventilation system. The absence of ventilation can adversely impact classroom performance and overall occupant health.
- Inspect the maintenance room for unsanitary conditions, leaks, and spills. Ensure the room is free of trash, chemical products, and supplies.
- Establish and implement a regular schedule for inspecting and changing filters.
- Ensure condensate pans are clean, unobstructed, and draining properly.
- Establish and implement a regular cleaning schedule for air supply diffusers, return registers, and outside air intakes.
- Check ground-level and roof intakes for pollutant sources (e.g., dumpsters, bus-idling areas, plumbing vents, and kitchen exhaust fans).
- Ensure that ducts and the interior of air-handling units or unit ventilators are clean.
- Keep unit ventilators clear of books, papers, and other items.
- Ensure HVAC system settings fit the actual schedule of building use (including night and weekend use).
- Educate teachers and school staff on the importance of keeping the HVAC system on to ensure classrooms are properly ventilated.
- Use EPA's IAQ Tools for Schools program resources to identify, correct, and prevent indoor air quality problems. The [IAQ Tools for Schools Action Kit](#) has been implemented in thousands of schools across the country.

## SCHOOL HIGHLIGHT:

### Fairgrounds Junior High School in Nashua, New Hampshire

Fairgrounds Junior High School in Nashua, New Hampshire underwent renovations between 1996 and 1997 to correct indoor air quality problems identified by the local health department. In May 1997, teachers came forward with indoor air quality-related complaints. To correct these problems, school facilities staff adjusted the energy management system shortly before school closed for the summer. When the school reopened in early September, however, complaints about temperature, discomfort, and odors resurfaced, along with complaints of dizziness and tingling sensations in the extremities.

School officials became concerned that broader indoor air quality problems existed and decided to pilot EPA's IAQ Tools for Schools program at Fairgrounds Junior High School. The school principal and two teachers presented the program at a staff meeting and recruited volunteers to form an indoor air quality team. The team distributed a health survey to teachers and staff at a faculty meeting and requested information on health problems experienced during work hours.

The IAQ Tools for Schools Action Kit, the health survey, and formal investigations helped the team to identify and resolve the problems. Since Fairgrounds Junior High School implemented the program in 1997, several more schools in the Nashua School District have adopted the IAQ Tools for Schools program.

## Tier 2: Key Elements for a Comprehensive School Environmental Health Program

Schools that have completed most of the actions listed under Tier 1 will be prepared to implement the key elements necessary for a more comprehensive school environmental health program.

- Continue to perform regular HVAC system inspections.
- Establish a HVAC maintenance plan.
- Install high efficiency filters, if not already in use.
- Take steps to ensure all rooms in the school building are ventilated.
- Ensure that air intakes are located away from high vehicular traffic areas, plumbing and exhaust stacks, and chimneys for the school's heating system.
- Install carbon monoxide detectors near combustion sources (e.g., boilers, stoves, hot water heaters, and vocational

### SCHOOL DISTRICT HIGHLIGHT: Charlotte-Mecklenburg School District in Charlotte, North Carolina

Charlotte-Mecklenburg Schools adopted EPA's IAQ Tools for Schools program after parental concerns about mold in the schools led to elevated community concern. The district created a new position, Manager of Environmental Health and Safety, and hired an indoor air quality expert with experience in indoor environmental health. Using a team approach, Charlotte-Mecklenburg Schools partnered with the University of Tulsa to plan a district-wide assessment program for all 150+ school facilities. The district implemented a two-track system for continuous assessment that includes a 24-hour response protocol to address occupant indoor air quality concerns and routine monthly building walkthroughs. Training is conducted for school staff using components of the IAQ Tools for Schools Action Kit.

Charlotte-Mecklenburg Schools has experienced real results from implementing an indoor air quality program:

- ★ By emphasizing indoor air quality fundamentals in the summer energy management program, the district has seen a 54% decrease in mold work orders.
- ★ One hundred percent of indoor air quality complaints are investigated within 24 hours.
- ★ Early identification and prompt response to indoor air quality concerns have reduced response costs from hundreds of thousands of dollars to less than \$10,000 in many cases.
- ★ School faculty and staff are more aware of indoor air quality, and a new commitment of fiscal resources has been made to address indoor air quality issues across the school district.

Learn more about [Charlotte-Mecklenburg Schools' indoor air quality program and their environmental stewardship initiative](#).

education shops) to monitor carbon monoxide levels.

- Ensure outdoor air ventilation meets or exceeds the industry's ventilation standard ([ASHRAE 62.1-2010 Ventilation for Acceptable Indoor Air Quality](#)) or local code.

### **Tier 3: Enhance a School's Pre-Existing Program**

Schools that have taken steps to implement a comprehensive school environmental health program can build on their pre-existing program(s) by considering the following:

- Apply new air ventilation, cleaning, and filtration technologies, as resources allow (e.g., MERV 13 air filters and gas filtration media).
- Apply the [ASHRAE 62.1-2010 IAQ Procedure](#). The IAQ Procedure is a performance-based design approach in which a building and its ventilation system are designed to maintain contaminant concentrations at specified levels.
- The use of air cleaning devices, other than particle filtration employed in the HVAC system, is generally not required if appropriate attention to controlling and managing sources of pollution and providing adequate ventilation are addressed in the design process. For additional information on air cleaning devices see:

## **School Advanced Ventilation Engineering Software**

EPA's IAQ Tools for Schools School Advanced Ventilation Engineering Software (SAVES) package can help school designers assess the potential financial payback and indoor humidity control benefits of energy recovery ventilation systems for school applications.

Learn more on [EPA's IAQ Tools for Schools SAVES](#) website.

- [Residential Air Cleaners: A Summary of Available Information](#)
- [Ozone Generators that Are Sold as Air Cleaners: An Assessment of Effectiveness and Health Consequences](#)
- Develop and record measures specific to the school that will demonstrate improvement in HVAC system performance.
- Engage students in classroom activities and projects that focus on indoor air quality
- Incorporate information and updates on indoor air quality into newsletters, school announcements, and other outreach material.



## Component 5: Prevent Pests and Reduce Pesticide Exposure

### Why Is This Important?

Droppings or body parts from cockroaches, rodents, and other pests can trigger asthma and can cause allergic reactions. Pests also can transmit infectious diseases. Pesticides contain chemicals that can be toxic to humans and the environment and pose a risk to human health, especially when people do not follow directions on product labels or if they use products irresponsibly (e.g., using pesticides when they are not needed, using pesticides for other than their intended use, or not following recommended application rates). Children can be especially vulnerable to pesticides because their internal organs are still developing and maturing.

Integrated pest management is an effective and environmentally sensitive approach to pest management that uses current, comprehensive information on the life cycles of pests and their interactions with the environment, in combination with available pest control methods, to manage pests economically, and with the least possible risk to people, property, and the environment. Integrated pest management is a safer and sometimes less costly option for effective pest management in schools. Integrated pest management practices can effectively control pests in schools while reducing pesticide use by 70–90%.<sup>21</sup> A school integrated pest management program uses common sense strategies to monitor and exclude pests while also reducing sources of food, water, and shelter for pests in school buildings and grounds. An integrated pest

management program should focus on prevention of pest problems first, and take advantage of all pest management strategies, including the judicious and careful use of pesticides, when necessary. EPA's [Integrated Pest Management \(IPM\) in Schools](#) website and other state school integrated pest management program websites (e.g., [California](#), [Florida](#), [New Jersey](#), [Pennsylvania](#), [Texas](#), and [Washington](#)) are good resources for schools and school districts to use in developing a school integrated pest management program.

### Actions Schools Can Take to Prevent Pests and Reduce Pesticide Exposure

#### Review Existing State Policy

Many states have implemented policies to promote healthy school environments. Refer to and follow your state's relevant environmental health policies and emergency management protocols when conducting integrated pest management activities. (States may insert relevant environmental health policies and emergency management protocols here.)

#### Tier 1: Simple Steps Schools Can Take to Get Started

The best way to launch a school environmental health program is to identify fixes and solutions that can be implemented immediately. Schools should start by asking questions like, where are the school's areas of greatest need and what resources

are available to address those needs? The answers to these questions will help schools decide where to focus their initial efforts.

Conduct an initial inspection of the school to identify potential pest problems. Identify immediate actions that can be taken for:

- **Entryways**
  - Keep doors shut when not in use.
  - Place weather stripping on doors.
  - Caulk and seal openings in walls.
  - Install or repair screens.
  - Install air curtains.
  - Keep vegetation, shrubs, and wood mulch at least 1 foot away from the school building.
- **Classrooms and Offices**
  - Immediately place garbage in a trash can with a lid that closes securely, and remove trash daily from the school building.
  - Allow food and beverages only in designated areas and store food in airtight containers.
  - Clean all food crumbs or spilled liquids immediately.
  - Wash dishes promptly after using them.
  - Keep counters, sinks, tables, and floors clean and clear of clutter and moisture.
  - Remove piles of boxes, newspapers, and other potential hiding places for pests.
  - Keep rooms as dry as possible by removing standing water and water-damaged or wet materials.
  - Frequently vacuum carpeted areas.
- **Food Preparation and Serving Areas**
  - Store food and waste in containers that are inaccessible to pests.
  - Place screens on vents, windows, and floor drains to prevent pests from using unscreened ducts or vents as pathways.

- Reduce the availability of food and water: remove food debris; clean all food crumbs or spilled liquids right away; fix dripping faucets and leaks; and dry out wet areas.
- Clean food preparation equipment after use and remove grease accumulation from vents, ovens, and stoves.
- Use caulk or paint to seal cracks and crevices.
- **Rooms and Areas with Extensive Plumbing**
  - Repair leaks and correct other plumbing problems to deny pests access to water.
  - Clean floor drains, strainers, and grates.
  - Seal pipe chases.
  - Keep plumbing areas dry.
  - Store paper products or cardboard boxes away from moist areas and direct contact with the floor or the walls.
- **Maintenance Areas**
  - Ensure mops and buckets are clean, dry, and stored appropriately.
  - Allow eating only in designated areas.
  - Immediately place garbage in a trash can with a lid that closes securely, and remove trash daily.
  - Keep areas clean and as dry as possible.

### **Tier 2: Key Elements for a Comprehensive School Environmental Health Program**

Schools that have completed most of the actions listed under Tier 1 will be prepared to implement the key elements necessary for a more comprehensive school environmental health program.

- **Establish a school integrated pest management program.** Key steps for implementing a successful integrated pest management program include:

- Developing an official integrated pest management policy statement. This statement acts as a guide in developing a specific integrated pest management program and should cover pest identification, pesticide applications, and notification requirements (e.g., when and who to notify of pesticide application). Integrated pest management policy statements should be kept in a commonly accessible location. For an example of an integrated pest management policy, view the [Los Angeles School District's Integrated Pest Management policy](#).
- Designating pest management roles and responsibilities. Education and training in integrated pest management practices should be provided.
- Setting specific pest management objectives for the school.
- Requiring regular site inspections and trapping to determine the types and infestation levels of pests.
- Setting action thresholds, or levels of pest populations/environmental conditions that require remedial action.
- Monitoring pests and recording information in a pest sighting log. This log can be used to identify whether pests have exceeded pre-determined levels before applying pesticides.
- Keeping written records of all aspects of the integrated pest management program (e.g., pest population and distribution, recommendations for future prevention, and complete information on treatment actions taken).
- Evaluating the integrated pest management program to determine the success of the pest management strategies employed.
- Once all integrated pest management strategies have been exhausted to control pests, use baits and traps before making a broad pesticide application.
- Follow these guidelines before applying pesticides:
  - Use pesticides that present the least risk of exposure.
  - Choose caulk and crevice pesticide applications, bait stations, or targeted spraying.
  - Carefully follow instructions on the label and use only the amount suggested.
  - Store all pesticides in a secure area of the building.
  - Do not use outdoor sprays and chemicals indoors.
  - Dispose of leftover pesticides and pesticide containers properly.
  - Do not transfer pesticides to other containers.
  - Do not spray during school hours, except in emergencies.
- When pest management services are necessary, the school should either contract with an integrated pest management certified professional or ensure that the facility management staff are licensed, trained, and able to implement integrated pest management practices as their state requires.
- Do not allow experimental, phased out, or conditional-use pesticides and pesticide products to be used in school buildings and on school grounds. Do not allow teachers and school staff to bring pesticide products from home.
- Maintain records on pest management activities, including pesticide application date(s), location(s), and rate(s); copies of pesticide labels; SDSs; and notifications issued.

### Tier 3: Enhance a School's Pre-Existing Program

Schools that have taken steps to implement a comprehensive school environmental health program can build on their pre-existing program by considering the following:

- Expand the school's integrated pest management program to address outdoor areas including playgrounds, parking lots, athletic fields, loading docks, and trash dumpsters.
- Develop and record measures specific to the school that will demonstrate improvement in pest management practices.
- Incorporate awareness of integrated pest management principles into the students' curricula.
- Incorporate integrated pest management information and updates into newsletters, school announcements, and other outreach material.



## EPA Grantees Support School Integrated Pest Management

Since 1996, EPA has invested more than \$3.2 million in extramural resources to support over 40 demonstration, outreach, and educational projects on school integrated pest management. This investment has yielded many successes, beginning with the Monroe Model for school integrated pest management. In the mid-1990s, the Monroe County Community School Corporation (MCCSC) developed a school integrated pest management program. Like most school districts, MCCSC used scheduled, monthly pesticide sprayings to control pests. A 1994 Indiana University study of MCCSC's pest management practices led to a pilot integrated pest management program at three MCCSC elementary schools. The multi-step program relied on communication, partnership, and sound pest management. It aimed to control pests effectively, reduce or eliminate pesticides used in schools, educate staff and students about pests in their schools, and demonstrate the integrated pest management concept. The success of their pilot program led MCCSC—using two \$30,000 EPA grants—to expand the program district-wide. With the integrated pest management program, now known as the *Monroe Model*, in place, MCCSC has experienced a 90% reduction in pesticide use, pest problems, and pest control costs. Money saved from reduced pesticide use enabled MCCSC to hire a district-wide pest management coordinator. MCCSC's work has become a model not only for Indiana school districts, but for the nation's many schools seeking to adopt integrated pest management programs. Since 2007, the Monroe Model has positively impacted over 1 million children nationwide as it has been adopted by other school districts. Much of the work being done in state coalitions and through the National School Integrated Pest Management Working Group stems from the *Monroe Model*.

Learn more about the [Monroe School Integrated Pest Management Model](#).

In 2011, EPA's Office of Pesticide Programs made available a Request for Applications for the School Integrated Pest Management Grants that would support projects that promote the adoption of verifiable integrated pest management practices in the nation's K-12 public schools. The projects that were selected will further EPA's mission through research, development, monitoring, public education, training, demonstrations, or studies of the adoption of verifiable integrated pest management by K-12 public schools that identify and reduce the risks associated with pesticide use. The following grantees were awarded funds to further promote school integrated pest management adoption:

**University of Florida:** *A School Integrated Pest Management Consortium Reaching One Million Children*

**Improving Kids Environment, Inc. (Indiana):** *Midwest United States Consortium - Expanding Verifiable Integrated Pest Management in Public Schools*

**Colorado State University:** *The Rocky Mountain Consortium - Expanding Verifiable School Integrated Pest Management in Public Schools*

**Washington State University:** *The Pacific Northwest School Integrated Pest Management Consortium - Expanding Verifiable School Integrated Pest Management in Public Schools*

**New Orleans Mosquito and Termite Control Board:** *Implementing a Verifiable School Integrated Pest Management Program in the Orleans Parish School System - A Collaborative Effort*

**Cooperative Educational Services Agency 10:** *Expanding School Integrated Pest Management in Wisconsin Using the Cooperative Educational Services Agency Model*

# Additional Opportunities for Promoting Environmental Health in School Facilities

Sustainable school environmental health programs are important for maintaining safe, healthy, and long-lasting school facilities. Careful planning is necessary to ensure that building upgrades contribute to the health and comfort of the building occupants. Routine maintenance and well-designed upgrades and improvements can extend the life of a school building, improve the health of the learning environment, and generate cost savings through increased energy and resource efficiency.

This section presents general information that schools can use as they plan for and undertake major construction and renovation projects, as well as recommendations for improving classroom comfort (e.g., lighting, acoustics, ventilation, and temperature control) and becoming more energy- and water-efficient. For more specific guidelines and standards, refer to guidance and rating systems specifically developed for school design and construction, including:

- [EPA's Voluntary School Siting Guidelines](#)
- [ENERGY STAR® for K-12 School Districts](#)
- [IAQ Design Tools for Schools](#)
- [U.S. Green Building Council – Center for Green Schools](#)
- [Collaborative for High Performance Schools \(CHPS\)](#)

## High Performance Schools and Children's Health

High performance schools are facilities that improve the learning environment while saving energy, resources, and money. High performance is not limited to energy and water conservation and efficiency. It requires taking a “whole-building” approach to design and considers the effects of healthy indoor environments on the building's occupants.

High performance design can have a positive effect on health and comfort, and design strategies such as day lighting have been shown to enhance student learning. Good design also produces more comfortable environments with proper lighting, air temperature, humidity, and noise levels. This reduces distractions and creates environments where students can see clearly, hear accurately, and not feel too warm or too cold.



## New Construction and Renovation Projects

New construction and renovation projects are good opportunities for schools and school districts to improve the health of the school environment, address areas of concern identified under the five key components of the model program, improve classroom comfort, and become more energy- and water-efficient. Incorporating high-performance elements in school buildings can result in lower operating and maintenance costs and reduced energy bills, and if properly planned and implemented, can contribute to healthy school environments. By adopting high performance practices, schools and school districts can lower their operating costs by up to 30%.<sup>22</sup> Existing schools can save 25% of operating costs by implementing some basic efficiency measures, occupant education, and engagement programs.<sup>23</sup>

The following practices and actions should be considered during the design and planning phases for construction projects and building renovations:

- When building or renovating a school, considering the location of the school and the needs of the surrounding community is important.
  - EPA's [Voluntary School Siting Guidelines](#) can help local school districts and their communities evaluate environmental factors to make the best possible school siting decisions.
  - EPA's [Smart Growth and Schools](#) website provides information and resources for applying smart growth principles to educational facility planning.

### Funding New Construction and Renovation Projects

Many schools are concerned about the costs involved in undertaking new construction and renovation projects. The [EPA Healthy School Environment Resources Financing](#) website provides links to cost/benefit studies and financial resources that can help schools pay for improvements to their infrastructure.

- Indoor air quality is a critical aspect to consider when designing and maintaining school facilities. [IAQ Design Tools for Schools](#) provides detailed guidance and links to additional resources to help design healthy new schools, as well as repair, renovate, and maintain existing facilities.
- Require the development and use of an indoor air quality management plan. The purpose of the management plan is to prevent residual problems with indoor air quality in the completed building and protect workers on the site from undue health risks during construction. The plan should identify specific measures to address:
  - Problem substances, including: construction dust, chemical fumes, off-gassing materials, and moisture. The plan should ensure that these problems are not introduced during construction, or, if they must be, eliminates or reduces their impact.

- Areas of planning, including: product substitutions and materials storage, safe installation, proper sequencing, regular monitoring, and safe and thorough cleanup.
- Schedule construction and renovation activities while school is out of session and all occupants are off premises, or ensure that building occupants are temporarily relocated to prevent exposure to harmful chemicals, dust, or particulates. Contractors should follow the EPA [Renovation, Repair, and Painting \(RRP\) Rule](#)'s occupant protection provisions, which include complying with all information distribution requirements under the RRP Rule and posting signs that clearly define the work area and warn occupants and other persons not involved in renovation activities to remain outside the work area. Another resource is the Sheet Metal and Air Conditioning Contractors' National Association's [Indoor Air Quality Guidelines for Occupied Buildings Under Construction](#), which provides guidance on maintaining good indoor air quality in occupied buildings undergoing construction or renovation.
- Be familiar with procedures used by contractors for protecting occupants at each stage of the construction/renovation process (e.g., isolating and ventilating the work area), and any other safety precautions that will be taken.
- Have contractors demonstrate that they have received all appropriate training and can produce all necessary certifications before work begins.
- Carefully select the materials and products (e.g., flooring/carpeting, wall/ceiling materials, paints and coatings, adhesives and sealants, and engineered wood products) to be used in the school's

construction and renovation projects. From an indoor air quality perspective, choose products that:

- Contain low-toxicity, water-based formulations;
- Release no or low VOC emissions;
- Emit little or no odor;
- Contain no heavy metals;
- Are formaldehyde free;

## Greening America's Schools: Costs and Benefits

In October 2006, Gregory Kats published a report that documents the financial costs and benefits of green schools compared to conventional schools. Among the findings discussed, the report highlights several health and learning benefits of green schools, including:<sup>24</sup>

- ★ A review of 17 separate studies all showed positive health impacts from improved indoor air quality, ranging from 13.5% to 87%.
- ★ A review of 17 studies from the mid-1930s to 1997 found that good lighting improved student test scores and achievement in the classroom.
- ★ An analysis of two school districts in Illinois found student attendance rose by 5% after incorporating indoor air quality improvements.
- ★ A study of the costs and benefits of green schools for Washington state estimated a 15% reduction in absenteeism and a 5% increase in test scores.

Read the full [report](#).

- Are easy to clean and maintain; and
- Are not susceptible to moisture damage that can foster mold growth.

For more information on materials selection and controlling contaminants, see the [IAQ Design Tools for Schools Controlling Pollutants and Sources](#) website.

- Indoor air quality is affected not only by the materials that are used in construction and renovation, but also by the order in which they are installed. Certain materials and finishes (e.g., composite wood products, adhesives, sealants, finishes, and gypsum board) off-gas potential indoor contaminants for a short duration after

they are manufactured or installed.

The contaminants off-gassed by these materials can be absorbed by “fuzzy” or “fleecy” materials as well as finishes (e.g., carpet, insulation, and fabric wall coverings) that are woven, fibrous, or porous in nature. As a result, these finishing materials can become repositories, or “sinks,” for substances that can be released much later or that promote subsequent mold growth. When possible, allow potential off-gassing materials to dry before finishing materials are installed.

- Be aware of potential health effects and safe handling procedures for chemicals and products being used or installed in the school by contractors. SDSs and other product literature are good resources.
- Include entry mat systems in the design of the school building.
  - Entry mat systems are critical in trapping soil, pollutants, and moisture that otherwise would spread into and throughout the building, as well as in reducing the cost to properly maintain the building.
  - The International Sanitary Supply Association reports that most of the dirt within a building is tracked in by shoes, and that 85% of this dirt can be removed if entry mats are properly designed and maintained.
- Install precipitation controls to keep school buildings dry.
  - Prevent rain and snow from causing moisture problems in school buildings:
    - Install sloped roofs to reduce the risk of moisture damage over the life of the building;
    - Landscape around school buildings to create ground slopes to carry water away from the building;

## School Renovation and Repair

Renovation is a major cause of poor indoor air quality in schools and often is conducted while the building is occupied. When planning and conducting renovations and repairs in schools, four potential causes of indoor air quality problems are important to remember:

- ★ Demolition that releases toxic materials (e.g., [lead](#), [asbestos](#), or [mold](#)).
- ★ Construction dust and fumes.
- ★ Designs that interfere with ventilation.
- ★ Off-gassing from new building materials and products.

To learn more about protecting occupants from renovation pollutants, visit the [IAQ Tools for Schools Renovation and Repair](#) website.

## Snapshot of Benefits from Green Retrofits<sup>25</sup>

A Deloitte and Lockwood poll of organizations that have undergone green (i.e., environmentally preferred) retrofitting projects reports that in addition to reducing costs, schools report a greater ability to attract and retain staff,<sup>26</sup> which is an important factor in improving school performance.<sup>1</sup> In the same poll, green (i.e., environmentally preferred) retrofits were reported to improve health, productivity, and attendance.<sup>1</sup>

- Ensure exterior entries have sufficient overhang to prevent rain or snow from collecting at the building's entrance, or being blown into the building; and
- Prevent air intakes from collecting precipitation.
- During construction, keep building materials dry, especially those with moisture absorbing properties (e.g., wood, insulation, paper, and fabric) to prevent the growth of mold and bacteria. If moisture is present, mold will grow on virtually any material.
- Wet materials need to be allowed to dry as much as possible.
  - Cover dry materials with plastic to prevent rain damage, and
  - If resting on the ground, use spacers to allow air to circulate between the ground and the materials.
- Implement dust controls during new construction and renovation activities. Common renovation activities like sanding, cutting, and demolition can create dust and paint chips that contain

contaminants, such as lead, that can be harmful to the health of children and school staff. EPA's [RRP Rule](#) requires that firms performing renovation, repair, and painting projects that disturb lead-based paint in pre-1978 homes and child occupied facilities<sup>b</sup> (including schools that serve children 6 years of age and younger) be certified by EPA and use certified renovators who are trained to follow lead-safe work practices. Firms can become certified by submitting a completed application and fee to EPA or an authorized state, as appropriate. Individuals can become certified renovators by taking an [eight hour training course](#) from an EPA-approved training provider. For more information, visit [EPA's Lead RRP](#) website.

- Incorporate simple design features that can reduce the likelihood of pest problems.
  - Eliminate potential places around the exterior of the school building where pests can hide or build nests.
    - Keep foundation walls free from open cracks.
    - Ensure glazing materials are free of cracks and holes.
  - Ensure doors, windows, and other outside openings have tightly fitted screens of at least 16 mesh per inch.
  - Ensure basement windows have rodent shields, storm windows, or other barriers.
  - Ensure ventilation openings are covered with material such as perforated sheet metal plates, cast iron grills, or wire mesh.

<sup>b</sup> "Child occupied facilities" are defined as those areas visited regularly by children, under the age of 6, on at least two different days within any week, provided that each day's visit lasts at least 3 hours, the combined weekly visits last at least 6 hours, and the combined annual visits last at least 60 hours. This may include, but is not limited to child care facilities, preschools, and kindergarten classrooms. (Regulatory Definition of Child Occupied facilities – 40 C.F.R. § 280.83).

- Clear the under-floor space of all vegetation, organic material, and construction materials.
- Provide minimum mechanical methods for preventing the entry of rodents into school buildings, including:
  - Covering foundation wall vents with metal grills or plates;
  - Sealing openings in the foundation and exterior walls created for pipes, cables, and conduits;
  - Covering windows located within two feet of ground level with wire screens; and
  - Ensuring minimum clearance between doors and door jambs.
- Ensure all joints, seams, penetrations, openings, and other sources of air leakage throughout the building envelope are caulked, gasketed, weather-stripped, wrapped, or otherwise sealed.
- Take steps to ensure the building is termite resistant, such as installing floor framing made of naturally durable or preservative treated wood.<sup>27</sup>
- EPA's ENERGY STAR program offers [Energy Design Guidance](#) for new construction projects.
  - The guidance is a set of suggested actions for building owners and design professionals to establish energy efficiency goals and ensure that energy is addressed at all levels of a construction project.
  - EPA encourages using these best practices for energy design as part of the overall design, construction, and operations process to translate design intent into buildings that perform and earn the ENERGY STAR.
- Use the ENERGY STAR [Building Upgrade](#)

**“Communities across the country have recognized the benefits of energy-wise design. In Montpelier, Vermont, for example, more than 300 volunteers from the community supplied labor to construct two new classrooms with natural day lighting, good ventilation, and energy-efficient design to create a positive learning environment.”<sup>28</sup>**

[Manual](#) to plan and implement building upgrades by following the five building upgrade stages: retro-commissioning, lighting, supplemental load reductions, air distribution systems, and heating and cooling systems. Chapter 10 focuses on issues specific to K-12 schools.

- Design teams should use ENERGY STAR [Target Finder](#) to set energy targets and receive an EPA energy performance score for projects during the design process. Energy targets account for how activities, people, and systems will affect energy use and enables the design team to make decisions that support the function and optimal energy efficiency of the school buildings. Projects that earn a score of 75 or higher are eligible for [Designed to Earn the ENERGY STAR](#) certification.
- Use the [Federal High Performance Sustainable Buildings Checklist](#), located in ENERGY STAR's measurement and tracking tool [Portfolio Manager](#), to assess the sustainability of an existing school building. The checklist was developed for federal agencies to assess their existing buildings against the [Guiding Principles for Sustainable Buildings](#):

- Employ integrated assessment, operation, and management principles;
  - Optimize energy performance;
  - Protect and conserve water;
  - Enhance indoor environmental quality; and
  - Reduce environmental impact of materials.
  - The Department of Energy has developed the [National Best Practices Manual for Building High Performance Schools](#), a resource for architects and engineers who are responsible for designing or retrofitting schools, and for the project managers who work for the design teams. The manual provides information on school design, building systems (e.g., lighting and electrical, mechanical and ventilation), day lighting, and resource-efficient building materials, among other topics.
  - The [International Code Council](#) developed the [International Green Construction Code](#) (IgCC) to establish minimum green requirements for new and existing buildings. IgCC is the first model code to include sustainability measures for the entire construction project and its site, from design to certification, and is expected to make buildings more efficient. School design teams can use IgCC as a guide for incorporating more high performance elements into new and existing school buildings.
  - Incorporate water-efficient products into building design and renovation plans. EPA's [WaterSense](#) program makes finding and selecting [water-efficient products](#) easy and ensures consumer confidence in those products with a label backed by third-party, independent testing and certification. Products bearing the [WaterSense label](#):
    - Perform as well or better than their less-efficient counterparts;
    - Are 20% more water-efficient than average products in that category; and
    - Provide measurable water savings results.
  - Many local water utility programs offer rebates for water-efficient products. For a list of rebates, please visit the [WaterSense Rebate Finder](#) website.
  - When replacing drinking water fixtures, make sure the new equipment is [NSF International Certified](#) "lead-free."
  - Consider seeking third-party certification for incorporating high-performance design features. Three recognized programs that emphasize building for high-performance and better environmental health are [Leadership in Energy and Environmental Design \(LEED\) for Schools](#), [CHPS](#), and [Green Globes](#).
    - [LEED for Schools](#) is intended for use in the design and construction phases of school building, and encourages project teams to use an integrated design approach from start to finish. Using this integrated approach, LEED promotes improved practices in:
      - Site selection and development;
      - Water and energy use;
      - Environmentally preferred materials, finishes, and furnishings;
      - Waste stream management;
      - Indoor air quality and occupant comfort; and
      - Innovation in sustainable design and construction.
- To become LEED certified, projects must meet all prerequisites and earn a minimum number of points in the six areas listed above. The number of

points earned determines the level of LEED certification the project receives.

- **CHPS** has developed a rating system specifically for schools. CHPS Criteria for high-performance schools cover seven topics under three categories:
  - Strategy
    - Integration
  - Design
    - Indoor environmental quality
    - Energy
    - Water
    - Site
    - Materials and waste management
  - Performance
    - Operations and maintenance

CHPS Criteria are available for California, Colorado, Hawaii, Massachusetts, New York, the Northeast (New Hampshire, Rhode Island, Connecticut, Maine, and Vermont), Texas, Virginia, and Washington. Schools in these states can choose from two programs: **CHPS Verified** and **CHPS Designed**.

- **CHPS Verified** provides an independent review of projects in California, Colorado, Connecticut, Hawaii, Massachusetts, Texas, and Virginia using the CHPS Criteria to assess their high-performance status. Projects that meet minimum certification receive a CHPS plaque.
  - **CHPS PreFab** provides an independent review and precertification of modular, relocatable, and prefabricated classroom modules. Schools can use CHPS PreFab in conjunction with CHPS Verified.
- **CHPS Designed** is a self-certification process for projects in California,

Hawaii, New York, Texas, Virginia, Washington, and the Northeast. CHPS Designed projects receive a certificate and use of the CHPS Designed logo.

CHPS has several resources available to assist in planning, designing, operating, commissioning, or maintaining school facilities.

- The **CHPS High Performance School Best Practices Manual** is a six-volume set of best practices that cover planning, design, maintenance and operations, commissioning, prefabricated classrooms, and the CHPS Criteria.
- The **CHPS Operations Report Card** benchmarks the current performance of existing schools, provides a report card of results, and makes suggestions for improvement in seven categories: energy efficiency, thermal comfort, visual comfort, indoor air quality, waste reduction, water conservation, and acoustics.
- The **CHPS High Performance Products Database** allows schools and school districts to search for products that meet CHPS and other green building criteria (e.g., low-emitting materials, recycled content, and Forest Stewardship Council Certified wood products), and deliver environmental and health benefits to school building occupants
- **Green Globes** is a Web-based program offered by the **Green Building Initiative** that includes green building guidance and third-party certification for commercial buildings, including schools. The Green Globes program includes:
  - A comprehensive environmental assessment protocol (areas of assessment include: energy, water,

resources, emissions, indoor environment, project management, and site);

- Software tools that speed and simplify online assessment;
- Best practices guidance for green construction and operations;
- Third-party assessors with green building expertise (e.g., green building design, engineering, construction, and facility operations); and
- A rating/certification system.

New and existing buildings must achieve 35% of 1000 total points in a preliminary self-evaluation to be eligible to seek a Green Globes certification and rating for their environmental sustainability and achievements.

- [The National Clearinghouse for Educational Facilities](#) and the [American Clearinghouse on Educational Facilities](#) can provide information and resources for schools undertaking construction and renovation projects.
  - The [National Clearinghouse for Educational Facilities](#) provides information on designing, building, and maintaining safe, healthy, and high-performing schools. Its database contains 167 school facilities topics.
  - The [American Clearinghouse on Educational Facilities](#) provides information, training, and assistance to schools on issues related to educational facility planning, design, financing, construction, improvement, operation, and maintenance.





## Enhancing Classroom Comfort

Proper design, maintenance, and operation of lighting systems, ventilation systems, thermal control systems, and acoustics have a significant impact on school building performance and occupant comfort. Environmental distractions (e.g., poor lighting, glare, poorly controlled temperature and humidity, and excessive ambient noise or poor acoustics) can affect the health, attention, and performance of students, faculty, and school staff. Existing schools, schools undergoing renovation,

and new schools can be enhanced by including design elements that maximize comfort and safety and enable building users to focus on education.

### Get Started

Conduct a walk-through of the school building to identify areas or rooms in greatest need for improvement. Specific building elements to look for include:

- Inefficient lighting (e.g., too dim or too much glare);

### SCHOOL DISTRICT HIGHLIGHT: Albemarle County Public Schools in Albemarle County, Virginia

Albemarle County Public Schools has implemented several energy efficiency measures, including district-wide lighting upgrades. Over the past 5 years, 26 schools and two other facilities in the district have undergone lighting retrofits. These comprehensive upgrades, which had payback periods of 2 to 3 years, focused on replacing T12 lamps with T5s and T8s and on installing occupancy sensors. Not every school received a whole-building retrofit: To keep costs down, the district's internal electricians performed the lighting retrofits for only a few rooms where appropriate. Whole-building retrofits were contracted out and funded from the Capital Improvement Projects account in the district's annual operating budget. Through these efforts, Albemarle County Public Schools not only cut its long-term energy costs, but also cost-effectively improved the safety of students, faculty, and staff members by replacing and properly disposing of old PCB ballasts.

Albemarle County Public Schools is committed to school environmental health beyond energy efficiency. The district hired an Environmental Compliance Manager in 2004 to investigate, document, and follow up on indoor air quality concerns and issues, and to develop an environmental management system. A chemical hygiene plan was established to standardize safety procedures, guidelines, and practices for all district classrooms, labs, and chemical storage areas, and to provide information and training to teachers and school staff concerning specific chemical hazards and safe work practices.

Visit the [Albemarle County Public Schools Environmental Management](#) website for more information.

- Poor acoustics and noise control features; and
- Poor and inefficient temperature control.

Although resources might not be available to address every issue encountered on the walk-through, simple actions can be taken to realize immediate improvements:

- Inspect ventilation systems to ensure they can provide a constant supply of air.<sup>29</sup>
- Inform teachers of trouble spots throughout the school building and encourage them to be flexible, and plan lessons and activities accordingly (e.g., use a classroom with poor acoustics for a study hall, not a music room).
- Wash windows and skylights frequently to maintain adequate day lighting.<sup>30</sup>
- Educate teachers, staff, and students on steps they can take to use building systems properly, such as:
  - Using lighting systems appropriately;
  - Keeping ventilation intakes clear;
  - Keeping windows closed when the HVAC system is on;
  - Removing obstructions from around heating and cooling equipment; and
  - Managing the HVAC system, in terms

of temperature control, humidity, and ventilation.

## Take Action

As resources allow, adopt high performance design elements in classrooms and throughout the school building, beginning with specific rooms and areas identified in the school walk-through.

Examples include:

- Install or upgrade to acoustical ceiling tiles, lined duct work, and HVAC systems with appropriately placed vents.<sup>29</sup>
- Locate information on the school building's acoustics and find out if the acoustical quality meets Standard 12.60, "Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools," of the American National Standards Institute. [Part 1](#) of the standard applies to classrooms in permanent school buildings, and [Part 2](#) of the standard applies to relocatable classrooms and modular learning spaces.
- Design lighting systems based on task, school room configuration, building layout, and surface finishes.<sup>1</sup>
- Install new or upgrade existing lighting fixtures. Lighting upgrades can improve

## SCHOOL HIGHLIGHT:

### The Academy for Global Citizenship in Chicago, Illinois

The Academy for Global Citizenship (AGC) is a public charter school in Chicago, Illinois that emphasizes sustainability and environmental stewardship. AGC has developed a Sustainability Handbook for Schools to help teachers, administrators, parents, and community members take steps toward incorporating environmental sustainability in their schools. The handbook offers strategies for several different environmental topics, including energy efficiency, waste reduction, and water conservation. Each topic features specific activities and action that schools and school districts can take, as well as success stories, environmental health benefits, and additional resources.

Learn more about [AGC](#) and download a copy of the [Sustainability Handbook for Schools](#).

the school's energy efficiency, and removing old lighting fixtures might help keep the school free from contaminants, including PCBs. To learn more see [Proper Maintenance, Removal, and Disposal of PCB-Containing Fluorescent Light Ballasts: A Guide for School Administrators and Maintenance Personnel](#).

- Install easy-to-operate lighting controls and manual blinds or other window treatments to control excessive sunlight or glare.
- Use paint with a matte finish to reduce excessive glare.
- Inspect heating and cooling equipment quarterly and change filters per maintenance schedule.<sup>30</sup>
- Adopt [EPA's SunWise program](#) for school use and to inform school infrastructure enhancements (e.g., sun-safe policies and shade structures).

## Beyond the Basics

High performance schools go beyond the basic elements of providing good acoustics, thermal control, adequate ventilation, and optimal day lighting. Consider implementing the following activities and practices:

- To determine how high performance building upgrades are impacting the school, consider developing and recording measures that will demonstrate improvements toward becoming a high performance school.
- Integrate lessons on high performance design elements into the student curricula. Visit the U.S. Green Building Council's [Center for Green Schools](#) website for more information.

## Benefits of Day Lighting in Schools

“Studies show that students perform better with natural light. In addition to educational benefits, day lighting offers significant energy and money savings. The school is not paying for electricity for artificial lights. The school also does not need to pay for cooling as a result of the heat from the lights. All these dollars saved can be directed toward the teachers and students—where the money should be going.”

—Michael Nicklas, President, Co-founder, Design Principal at Innovative Design in Raleigh, North Carolina, and Lead Architect for Northern Guilford Middle School

For more information, see the Department of Energy EnergySmart School Case Study for [Northern Guilford Middle School](#).

Classrooms with the most day lighting had a 20% faster learning rate in math and a 26% faster learning rate in reading during one school year when compared to classrooms with the least amount of day lighting.

For more information, see [Windows and Classrooms: A Study of Student Performance and the Indoor Environment](#).

States spend more on energy than any other school-related expense, aside from personnel. Existing schools can achieve higher performance by targeting energy efficiency in school operations and maintenance and can typically reduce energy bills by 5% to 20% even without significant capital investment.<sup>22,31</sup> School districts can use the savings from lower energy bills to pay for building upgrades that enhance the health and quality of the students' learning environment. ENERGY STAR provides a wealth of resources for

[K-12 school districts](#) interested in reducing their utility bills, improving their energy performance, receiving recognition, and improving the learning environment. ENERGY STAR certified schools use 35% less energy than typical buildings and emit 35% less carbon dioxide.<sup>22</sup>

Schools and school districts performing building upgrades should ensure that the upgrades make their facilities more energy-efficient and healthier at the same time. When done properly, many energy efficiency upgrades can improve the quality of a

### SCHOOL DISTRICT HIGHLIGHT: **Lakota School District in Butler County, Ohio**

In an effort to upgrade its school building systems to improve the learning and teaching environment, the Lakota School District entered into a three-phase multimillion dollar facilities upgrade project with the Trane Corporation that will save the school district \$667,000 in annual energy costs and more than \$260,000 in annual operating costs. As a result of energy-efficient facilities upgrades, Lakota schools will receive an additional \$382,000 in rebates from the utility company, Duke Energy.

Some of the projects include:

- ★ Mechanical and control system improvements in 9 schools.
- ★ Plumbing retrofits in 13 buildings.
- ★ Lighting upgrades in all schools.

Phase One results have already exceeded savings projections by 15%, equal to \$35,000 in savings over the original projections. Overall energy and operating cost savings are expected to be \$927,000 per year. Mike Taylor, Lakota Schools Superintendent, said, "It's great in these tight budgetary times that we are able to improve the teaching and learning environment while generating energy and operational savings. Because we are able to pay for the improvements through these savings, we can focus our capital budget on other needs in the district."

Learn more about Lakota School District's [facilities upgrade project](#).

school's indoor environment, protecting—even enhancing—indoor air quality without sacrificing energy performance. If certain energy upgrades are not done correctly, however, they might adversely impact indoor air quality and cause other health concerns for children and staff. For example, increased energy efficiency in building construction, in some cases, has resulted in tighter building shells and reduced ventilation rates. EPA's [Energy Efficiency and Indoor Air Quality in Schools](#) working paper describes how to enhance energy efficiency while protecting indoor air quality.

Another way schools and school districts can save money and conserve resources is to become more water-efficient. Schools use a tremendous amount of water every day in a variety of applications, including:

- Heating and cooling systems,
- Restrooms,
- Drinking water fountains,
- Locker rooms,
- Cafeterias,
- Laboratories and classrooms, and
- Outdoor playing fields and lawns.

EPA's [WaterSense](#) program provides resources to help schools make more water-efficient choices. WaterSense-labeled products increase public awareness concerning products that are independently certified to provide water efficiency without sacrificing performance. By adopting and promoting water-efficient products, services, and practices, schools and school districts can greatly reduce annual water and energy costs, and help reduce the stress on natural resources.

## Get Started

Conduct a walk-through of the school building to identify areas or rooms where energy or water efficiency upgrades

can be made. Although resources might not be available to address every issue encountered on the walk-through, simple actions can be taken to realize immediate improvements:

- Understand the school district's policy/program goals regarding energy and water efficiency.
  - Interview school personnel responsible for energy and water use.
  - Check the partner list on ENERGY STAR's [K-12 School Districts](#) website to determine if the school/school district is a partner in the ENERGY STAR program. If not, take steps to become an ENERGY STAR partner and demonstrate the school's commitment to energy efficiency.
- Determine the school's energy and water use baseline using ENERGY STAR's measurement and tracking tool, [Portfolio Manager](#). Schools also can receive an ENERGY STAR energy-performance score (on a 1–100 scale) that ranks their energy performance relative to similar buildings nationwide.
- Inspect the school's plumbing system regularly. Immediately repair plumbing problems encountered during inspections.
- Perform periodic leak audits to determine if leaks are occurring when water is not being consumed. Turn off all water-consuming appliances, take a baseline water meter reading, avoid water usage for two hours, and take a second water meter reading. If the two readings differ, a leak is occurring. Immediately repair any leaks identified during the leak audit.
- Landscape the school grounds using plants with low-water needs, and water only when necessary (preferably during cooler times of the day).

- Use a broom to clean walkways, driveways, and entrances rather than hosing off or using a blower to clean these areas.
- Operate and maintain all building systems (e.g., chillers, cooling towers, boilers, plumbing fixtures, and cafeteria equipment) as efficiently as possible.
- Educate teachers, staff, and students on best practices for saving energy and water such as:
  - Turn off lights and electronics when they are not being used.
  - Keep vents clear.
  - Do not leave doors open to the outside longer than necessary.
  - Conserve water usage in restrooms and locker rooms by reducing excessive water consumption during hand washing and showers.
- Use [Portfolio Manager](#) to track energy and water use, set goals, and measure progress. This tool allows a school to:
  - Track multiple energy and water meters for each facility;
  - Rate building energy performance against similar buildings nationwide;
  - Track greenhouse gas emissions;
  - Set investment priorities; and
  - Earn the ENERGY STAR. Schools earning an ENERGY STAR energy performance score of 75 or higher using [Portfolio Manager](#) might qualify for ENERGY STAR certification.
- Develop an energy management plan using [ENERGY STAR Guidelines for Energy Management](#). These guidelines can help schools and school districts improve their energy, environmental, and financial performance.
- Develop a plan to replace pre-1979 fluorescent lighting to reap significant energy benefits and remove PCB-containing lighting ballasts from the school building. To learn more about PCBs in lighting fixtures, see [Proper Maintenance, Removal, and Disposal](#)

## Take Action

As resources allow, adopt energy- and water-efficient technologies and practices throughout the school building, beginning with specific rooms and areas identified in the school walk-through. Examples include:

### SCHOOL DISTRICT HIGHLIGHT:

#### **Manitou Springs School District 14 in Manitou Springs, Colorado**

The Manitou Springs School District in Manitou Springs, Colorado developed a sustainability management plan (SMP) through a grant provided by the Colorado Governor's Energy Office. The 30 page plan defines what a SMP is, the school district's mission and vision for sustainability, the SMP's goals and priorities, and the SMP's steps for implementation. Manitou Springs's SMP is a useful model for schools and school districts looking to develop a sustainability plan, and can serve as a foundation for addressing environmental health activities.

Download a copy of Manitou Springs School District's [Sustainability Management Plan](#).

### of PCB-Containing Fluorescent Light Ballasts: A Guide for School Administrators and Maintenance Personnel.

- Establish a summer and evening energy policy that minimizes the use of electricity and other forms of energy. The policy should:
  - Identify which rooms/areas of the school building will be occupied and limit the use of lights and electricity accordingly.
  - Establish appropriate temperature controls when the school building is not occupied.
  - Establish procedures for ensuring windows and doors are closed when appropriate.
- Develop a procurement policy that favors the purchase of ENERGY STAR qualified products (e.g., kitchen and office equipment, computers, and water heaters) and WaterSense labeled products (e.g., showerheads, toilets, and sink faucets).
- Consider launching an energy efficiency competition to get students, faculty, and staff excited about a new energy management program, or to enhance an existing program. Refer to ENERGY STAR's [Guide to Energy Efficiency Competitions for Buildings & Plants](#) for guidance on planning and launching a competition, as well as case studies and best practices from recent competitions.
- Utilize the [Low Carbon IT Campaign](#), which promotes low-power "sleep" settings on computers and provides:
  - Free technical expertise on how to best activate the settings on the school's network;

- An estimate of the school's savings; and
- An official certificate of recognition from EPA acknowledging the school's efforts.
- Maximize the performance efficiency of equipment by maintaining an appliance servicing schedule.
- Replace older equipment (e.g., dishwashers and washing machines) with energy-saving devices.
- Install water-saving devices wherever possible:
  - Water aerators and automatic shut off devices on faucets.
  - High-efficiency showerheads and timer shut-off devices to reduce water use during showers.
  - Sensors for outdoor sprinklers and irrigation systems to water grounds only when needed.
- Maximize natural vegetative cover on school grounds and maintain playing fields with drought-tolerant grasses.

### Beyond the Basics

High performance schools go beyond conserving water and energy in their daily operations and maintenance. Consider implementing the following activities and practices:

- Develop and record measures specific to the school that will demonstrate improvements in energy and water efficiency. Examples include:
  - Cost savings on electric, water, and gas invoices.
  - Cost savings in purchasing paper products, light bulbs, and maintenance services for office equipment and other electronics.

- Cost savings through reduced water use by installing more water-efficient equipment.
- Develop [energy](#) and [water use](#) lesson plans and familiarize students with best practices for saving [energy](#) and [water](#). Lessons can be applied in science, math, environmental science, and other courses.
- Consider investing in [solar panels](#), [green roofs](#), or [rain barrels](#). These options not only contribute to energy and water efficiency, but can be integrated into classroom curricula as well.
- Install water filling stations to encourage students to fill their own water bottles and reduce the use of plastic water bottles in schools.
- Include information and updates on energy and water efficiency in newsletters, school announcements, and other outreach material.

## Kentucky Energy Efficiency Program for Schools

The Kentucky Energy Efficiency Program for Schools (KEEPS) was the brainchild of the Kentucky Department of Energy, and began as a pilot program in 2006 with six school districts. In 2008, Kentucky House Bill 2 (section 16) required that all school districts participate in KEEPS by January 2010. Under the mandate, schools are required to adopt a school board-approved energy policy and submit a copy of their energy management policy to the state. The KEEPS program follows the Guidelines of Energy Management, the seven-step framework developed by ENERGY STAR.

KEEPS's energy efficiency efforts promote not just energy savings, but improved environmental health. Properly maintained HVAC systems ensure consistent temperatures for comfort and controlled humidity levels that mitigate moisture and mold growth. Functioning ventilation systems ensure students have an adequate supply of fresh air, and lighting retrofits can enhance the quality of classroom lighting and remove potentially harmful chemicals (e.g., PCBs) from the school building.

Since the mandate, all 174 school districts in Kentucky have adopted a school board-approved energy policy. The State of Kentucky was later recognized by EPA as an ENERGY STAR Partner of the Year for program implementation.

*"We learned that initially you can have lots of savings due to facilities modifications, etc., and utility bill analysis (huge savings of 100,000s of dollars). However, to have long term year-to-year sustainable results, you have to have behavior modification, good maintenance practices, and culture change."*—KEEPS

Learn more about [KEEPS](#).

## Additional Actions to Promote Environmentally Friendly School Facilities

Many high performing schools address the three Rs in their environmental health programming: reduce, reuse, and recycle. Consider implementing the following activities and practices:

- Provide recycling bins for plastic; office paper, newspaper and cardboard; aluminum and tin; and glass.
- Establish practices to minimize [food waste](#) from cafeteria food production.
- Implement a procurement policy that emphasizes purchasing school supplies and equipment made with recycled content (e.g., paper products, engine oil, and paints).





## Faculty and Staff Training

A successful school environmental health program relies on the active participation of all persons involved. From school administrators and teachers, to nurses and maintenance personnel, all faculty and staff have a role in protecting the school's environmental health. As such, training is an effective way to ensure that faculty and staff understand their roles and how they contribute to the success and sustainability of the program.

Training opportunities should be provided to faculty and staff in advance of program implementation and should address all aspects of the school environmental health program, not just those areas that relate directly to the faculty and staff members' primary responsibilities. An integrated training curriculum should educate trainees on:

- Children's environmental health and safety in schools;
- The purpose of a school environmental health program;
- The components of the program;
- The benefits for students, faculty, and staff;
- Behavior change in the classroom (e.g., prohibiting cleaning products from home or using unauthorized and possibly toxic art materials); and
- The policies and procedures currently in place that support the program.

Refresher training should be offered annually to provide updates and reinforce the program's goals. Tying training opportunities to continuing education units

for certification can be an incentive for faculty and staff to participate.

The section below describes specific issues and topics that training activities should address for each of the five key components of a school environmental health program. Additional information and training material can be found on the following websites:

- [Safe Chemical Management in Schools](#)
- [IAQ Tools for Schools Program](#)
- [Integrated Pest Management \(IPM\) in Schools](#)
- [ENERGY STAR for K-12 School Districts](#)
- [Green Schools Alliance<sup>c</sup>](#)
- [Classroom Earth<sup>d</sup>](#)

### Practice Effective Cleaning and Maintenance

- Roles and responsibilities of program participants (including teachers, the health program coordinator, staff, maintenance personnel, and any other persons involved with implementation).
- Policies and procedures for effective cleaning and building maintenance.
  - [Purchasing and using less toxic cleaners, art supplies, and other materials](#)
  - [Resources for school cleaning and maintenance practices](#)
- Potential environmental health risks (e.g., allergens and irritants).

c Reference to the Green Schools Alliance does not constitute an endorsement by EPA.

d Reference to Classroom Earth does not constitute an endorsement by EPA.

### Prevent Mold and Moisture

- Roles and responsibilities of program participants (including teachers, the health program coordinator, staff, maintenance personnel, and any other persons involved with implementation).
- Policies and procedures for preventing moisture and mold.
  - [Mold remediation in schools.](#)
- Potential environmental health risks (e.g., molds).

### Reduce Chemical and Environmental Contaminant Hazards

- Roles and responsibilities of program participants (including teachers, the health program coordinator, staff, maintenance personnel, and any other persons involved with implementation).
- State and local purchasing, use, storage, and disposal guidelines.
- Chemical management, hazards, safety practices, and other requirements for handling chemicals.
- The school's hazard communication plan and familiarizing faculty and staff with the school's emergency policies, procedures, and points of contact.
- Purchasing and using less toxic lab chemicals, art supplies, and other materials.
- Recognizing and treating injuries resulting from chemical exposures or accidents.
- How to properly use chemical safety and personal protection equipment.

- How to read an SDS and where to locate SDSs in the school building.

### Ensure Good Ventilation

- Roles and responsibilities of program participants (including teachers, the health program coordinator, staff, maintenance personnel, and any other persons involved with implementation).
- [The benefits of good indoor air quality.](#)
- Policies and procedures for maintaining HVAC systems, and ensuring that maintenance staff have the tools needed to keep the HVAC system in good condition.
  - [HVAC systems.](#)
- Awareness of [indoor asthma triggers.](#)
- [Guidance for building indoor air quality.](#)

### Prevent Pests and Reduce Pesticide Exposure

- Roles and responsibilities of program participants (including teachers, the health program coordinator, staff, maintenance personnel, and any other persons involved with implementation).
- Policies and procedures for effective pesticide use.
- [Pesticides: topical and chemical fact sheets.](#)
- Educating faculty and staff about [integrated pest management in schools.](#)
- [The risks of pesticide exposure.](#)
- Guidance on integrated pest management strategies and practices.



## Student Curricula

In addition to faculty and staff, students should understand the variety of environmental health issues encountered in schools and how they can contribute to sustaining a school environmental health program. Student involvement will enhance their knowledge of the environmental health issues that affect them, and will give them a sense of ownership and accountability in the ultimate success of the program.

Environmental health projects can easily be incorporated into appropriate lesson plans (e.g., science and health) that meet state learning standards. Teachers should receive approval from the school district, district curriculum and academic directors, and the school principal, as appropriate, for their new curricula before introducing it in the classroom, and should consider pilot testing the curricula before launching on a wider scale.

In addition to adopting environmental health curricula, schools should encourage students to explore environmental health topics for science fair projects, engage in extracurricular activities that relate to the environment or environmental health, and participate in volunteer opportunities that promote environmental stewardship. Additional information and course material can be found on the following websites:

- [Safe Chemical Management in Schools](#)
- [IAQ Tools for Schools Program](#)
- [Integrated Pest Management \(IPM\) in Schools](#)

- [ENERGY STAR for K-12 School Districts](#)
- [USGBC LEED for Schools](#)
- [Green Education Foundation<sup>e</sup>](#)
- [Green Schools Alliance<sup>f</sup>](#)
- [National Environmental Education Foundation<sup>g</sup>](#)
- [Classroom Earth<sup>h</sup>](#)

### Practice Effective Cleaning and Maintenance

#### Grades K–5

- Discuss with students the source of dust and allergens, and brainstorm ways to minimize dust and allergens in the classroom.

#### Grades 6–8

- Identify common household products (e.g., baking soda and vegetable oil) that can be mixed into green cleaning solutions, and have students work with science teachers to test appropriate recipes for homemade cleaning products.
- Research safer alternatives to common household cleaning products.

#### Grades 9–12

- Have students conduct an informal

<sup>e</sup> Reference to GEF does not constitute an endorsement by EPA.

<sup>f</sup> Reference to the Green Schools Alliance does not constitute an endorsement by EPA.

<sup>g</sup> Reference to the National Environmental Education Foundation does not constitute an endorsement by EPA.

<sup>h</sup> Reference to Classroom Earth does not constitute an endorsement by EPA.

inventory of cleaning products in their homes (with an adult present, if necessary). Identify any hazardous/toxic substances listed on the labels and discuss why they pose a risk to human or environmental health.

- Encourage students to conduct research and science projects on dust and allergens and their impacts on human health.

## Prevent Mold and Moisture

### Grades K–5

- Discuss the link between moisture and mold, and brainstorm ways to prevent mold growth at school and at home.

### Grades 6–8

- Observe the growth of different kinds of food molds.
- Have students research the health effects of mold, how to recognize various types of molds, and ways to mitigate mold growth.

### Grades 9–12

- Arrange for students to accompany facility/maintenance staff on a walk-through of the school to identify areas where mold and moisture are common.
- Grow molds on different types of surfaces and identify the best ways to mitigate mold growth for each surface.
- Encourage students to conduct research and science projects on moisture and mold.

## Reduce Chemical and Environmental Contaminant Hazards

### Grades K–5

- Design a game to help students recognize symbols and words that identify products containing hazardous substances.
- Brainstorm how chemical safety can prevent pollution at home.
- Introduce the concept of the water cycle and how different types of contaminants can be introduced at each stage.

## Green Education Foundation

The [Green Education Foundation \(GEF\)](#) is a non-profit organization committed to creating a sustainable future through education. GEF provides curricula and resources to K-12 students and teachers worldwide with the goal of challenging youth to think holistically and critically about global environmental, social, and economic concerns and solutions. GEF couples standards-based curricula with active participation, acknowledging that children learn best through hands-on activities that enhance their critical thinking skills.

- Participate in EPA's National Radon Poster Contest or hold a school-wide radon poster contest.

### Grades 6–8

- Educate students on the proper handling, storage, and disposal of chemicals and chemical products.
- Have students pick a chemical/contaminant and research its history, use, and impact on human health and the environment.
- Create chemical safety bulletin boards, posters, or other displays.
- Encourage students to test or monitor the water quality at different taps throughout the school building.

### Grades 9–12

- Familiarize students with chemical safety equipment, procedures, and SDSs.
- Encourage students to conduct research projects on the health impacts associated with exposure to environmental contaminants.

- Educate students on the importance of testing for lead in drinking water and incorporate appropriate lead testing methods into laboratory curricula.
- Incorporate simple toxicology lessons into science or health classes to help students make safer product choices.

## Ensure Good Ventilation

### Grades K–5

- Create ABC books using indoor air quality vocabulary words.
- Create dioramas to demonstrate mechanical air flow.
- Identify and discuss the causes of indoor air pollution.

### Grades 6–8

- Define the concept of the indoor environment and list properties of the indoor environment.
- Design inventions that will prevent or fix indoor environment problems.
- Create indoor environment or indoor air quality bulletin boards or other displays.

### Grades 9–12

- Solve problems using the IAQ Tools for Schools Action Kit Problem Solving Wheel.
- Invite a member of the facility/maintenance staff to talk with students about how an HVAC system works. Arrange for students to accompany facility/maintenance staff on a building walk-through to gain hands-on experience.
- Conduct a heating and cooling audit for the school.
- Encourage students to conduct research and science projects on HVAC systems and good ventilation.
- The National Education Association Health Information Network has created a series of [hands-on, interactive lesson](#)

[plans geared toward grades K-12](#). All lesson plans are tied to state education standards and can be integrated into a school district's curriculum.

## Prevent Pests and Reduce Pesticide Exposure

### Grades K–5

- Identify and categorize different types of pests.
- [Incorporate activity books on integrated pest management](#) into the curricula.
- [Incorporate educational activities about pests and pest control](#).

### Grades 6–8

- Define the concepts of integrated pest management, and discuss the different ways integrated pest management can be applied in school and at home.
- Inspect the school for evidence of pests or areas where pests might thrive and suggest solutions to fix and prevent pest problems.
- Have students research the history of pesticides and learn how to read a pesticide label.

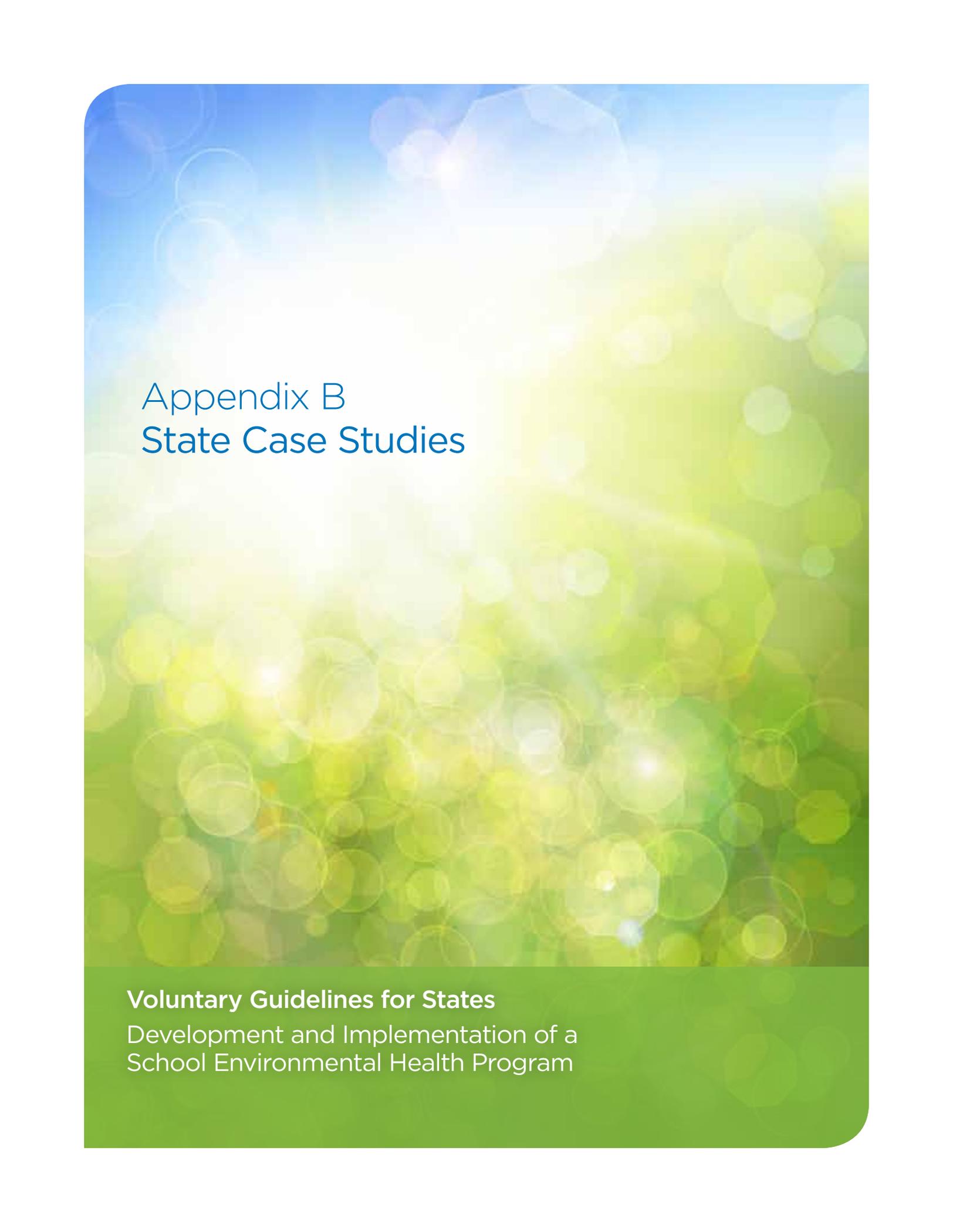
### Grades 9–12

- Have students research school integrated pest management programs and develop an integrated pest management program for their school.
- Approach facility/maintenance staff about conducting a pest monitoring project.
- Encourage students to conduct research and science projects on integrated pest management and pesticides.

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Appendix B  
State Case Studies

**Voluntary Guidelines for States**

Development and Implementation of a  
School Environmental Health Program

# Colorado Case Study

## Colorado Coalition for Healthy Schools (CCHS): Coalition and Coordination Group Success

### Background

Colorado Connections for Healthy Schools (CCHS) began as a result of funding received in 2003 from the Centers for Disease Control and Prevention (CDC) for a Coordinated School Health initiative. CCHS was first established to provide professional development to schools and their partners to help implement Coordinated School Health efforts in Colorado's schools. Effective 2012, Colorado Connections for Healthy Schools became the Colorado Coalition for Healthy Schools to reflect the program's evolution into a statewide coalition that addresses school health more broadly and comprehensively.

### The Program

The Coordinated School Health strategy promoted by CCHS is an approach that Colorado schools are encouraged to adopt. Grant support is offered to participating schools, and schools with successful implementation efforts are encouraged to act as champions and promote the strategy to other schools within their district. As of February 2012, over 300 schools participate, including those in rural, mountain, and metropolitan communities.

CCHS can be defined through a five-tier structure:

- **CCHS Membership** (800 members) is responsible for identifying and aligning goals and resources for professional development, data, funding, and communication.

The CDC's Coordinated School Health strategy is recommended as a way to improve students' health and learning in our nation's schools. Coordinated School Health consists of eight components:

1. Health education
2. Health services
3. Counseling
4. Nutrition services and education
5. Physical education and activity
6. Family and community involvement
7. Staff wellness
8. Healthy school environments

- **The Interagency School Health Team** has grown from content experts leveraging resources, coordinating activities, and sharing information to become a steering committee for CCHS.
- **The Management Team** provides implementation oversight of the CDC grant initiative, including monitoring the School Level Impact Measures that are measured using the School Health Profiles school level policy and activity survey.
- **School District Health Coordinators** (in districts where Coordinated School Health is implemented) promote the strategy at the district level, provide oversight, and are a resource for implementation to school level health teams.

- **School Health Teams** plan, coordinate, and monitor school-based health goals that were developed to meet students' health needs in their respective schools.

In addition, local school health champions and interested community partners play a significant role in educating others about CCHS by highlighting the connection between student academic achievement and health.

Several resources are available to assist schools and school districts using Coordinated School Health supported by CCHS. Colorado's Roadmap to Healthy Schools provides information to schools and school districts on forming school health teams, adopting school health plans, and institutionalizing Coordinated School Health. The Healthy School Champions Scorecard, an online recognition tool, is often used as an additional method to inform a school's health assessment. The scorecard was developed by core members of CCHS and allows schools and school districts to formally rate just how healthy their schools are for students, teachers, and staff.

### Program Highlights

- By institutionalizing a statewide infrastructure for school health, with foundation support leveraging the funding from the CDC initiative, CCHS has evolved into a grassroots driven multi-purpose school health coalition.
- The Healthy School Champions Scorecard has successfully encouraged schools to showcase their efforts to meet healthy schools criteria. In the first year, over 100 schools completed the scorecard to find out their healthy school rating, and the top 15 schools were formally recognized and received grant recognition awards ranging from \$1,000 to \$5,000. This recognition has become an annual event sponsored by state foundations.

CCHS is championed by a core group of partners including:

- ★ Colorado Department of Education;
- ★ Colorado Department of Public Health and the Environment;
- ★ Colorado Legacy Foundation;
- ★ Colorado Health Foundation;
- ★ Center for Research Strategy;
- ★ Creative Media Solutions; and
- ★ RMC Health.

- Partnerships, stakeholder involvement, and interagency collaboration are key components of CCHS and have facilitated the incorporation of the healthy school framework in over 300 schools throughout the state.

### Lessons Learned

- Building a variety of relationships that include influential decision-makers (e.g., school board members) can facilitate formation of a coalition like CCHS that ensures support of school health efforts in the state.
- Branding your work and developing a messaging/marketing plan is important, as well as enlisting the talents and interest of key stakeholders to promote the program.
- It is necessary to listen to and keep the end user (e.g., the schools and students) involved in the process as much as possible.

### More Information

Colorado Department of Education website:  
[www.cde.state.co.us/](http://www.cde.state.co.us/)

Colorado Coalition for Healthy Schools Schools (CCHS) website:  
[www.healthyschoolchampions.org/](http://www.healthyschoolchampions.org/)

# Connecticut Case Study

## Connecticut Tools for Schools Program

### Background

Connecticut's Tools for Schools program was created to address the numerous calls the Connecticut Department of Public Health was receiving on indoor air quality issues, as well as several illness situations that had arisen in schools throughout the state. The Connecticut Department of Public Health worked with the U.S. Environmental Protection Agency (EPA) Region 1 to develop a statewide Tools for Schools indoor air quality program. After school districts requested implementation assistance, the Connecticut Department of Public Health organized a resource team that evolved into a multi-agency consortium known as CSIERT (Connecticut School Indoor Environment Resource Team). Currently, this team includes 24 agencies and organizations.

### The Program

Connecticut's Tools for Schools program promotes a low-cost, problem-solving, team-based approach to improving indoor air quality in schools. After committing to the program, participating schools must establish a Tools for Schools building team, including an administrator, school nurse, head custodian, and a parent. The building team receives 5 hours of training on school indoor air quality and how to conduct a walk-through investigation, and develops a plan for getting started. Once a walk-through has been conducted, the team prioritizes a list of action steps and identifies a timeline for completion. Connecticut state law requires all public schools to have an indoor air program.

Some of the 24 CSIERT agencies and organizations include:

- ★ Connecticut Association of Boards of Education
- ★ Connecticut Education Association
- ★ Connecticut Association of School Business Officials
- ★ Connecticut Department of Education
- ★ Connecticut Department of Energy and Environmental Protection
- ★ Connecticut Department of Public Health
- ★ Connecticut Parent Teacher Association
- ★ Connecticut School Building and Grounds Association
- ★ Connecticut School Nurses Association

Connecticut's Tools for Schools program has expanded since its inception to address a variety of environmental health issues. Its growth has been driven by the passage of school health laws and mandates by the state, including: anti-idling and diesel emission reduction laws; a green cleaning mandate for schools; a pesticides-in-schools law; and a law requiring new schools be constructed to high performance (energy-efficient) standards. As of July 2011, Connecticut school districts must implement a green cleaning program.

CSIERT's training and outreach efforts, tailored to Connecticut schools' needs and state environmental health policies, play a critical role in Connecticut's Tools for Schools program. CSIERT's flagship training program is a 2part, five hour implementation workshop for school staff and parents that covers indoor air quality health issues, how the Tools for Schools program works, conducting site walk-throughs, prioritizing indoor air quality problems, and communication. A custodian training workshop and a refresher training workshop are also available. All training opportunities are free, conducted at the school district level, and administered based on how mature a district's program is (e.g., new or existing program). Although the focus of training is indoor air quality, CSIERT has added modules that address green cleaning, pest management, and diesel emission reduction strategies. CSIERT also provides ongoing consultation with school building teams to set priorities and answer technical questions; offers a train-the-trainer curriculum; gives presentations to school systems; and conducts workshops at statewide conferences. An on-going evaluation program measures the impact on schools that implement Connecticut's Tools for Schools program.

## Program Highlights

As of January 2012:

- CSIERT has implemented its school environmental health program in more than 150 school districts across the state.
- CSIERT has conducted refresher training for 374 schools in 64 school districts.
- CSIERT has provided training for custodians in 607 schools in 53 school districts.
- CSIERT has conducted over 690 training workshops for school building teams and custodians.
- Over 7880 school staff, parents, and others have been trained.

- CSIERT has made presentations to more than 155 Connecticut school systems.
- Four full-day workshops have been conducted using the train-the-trainer curriculum.
- Connecticut Department of Public Health and CSIERT have published a paper about the program, "A Statewide Multiagency Intervention Model for Empowering Schools to Improve Indoor Air Quality." The paper appeared in the September 2011 issue of the Journal of Environmental Health.

## Lessons Learned

- The key to success with the CSIERT consortium model is maintaining regular communication between stakeholder organizations and their members about implementing and improving the program.
- Sell the program to school districts. Give a buy-in presentation to the superintendent and executive staff to obtain support before moving forward with training or program implementation.
- A key part of Connecticut's program strategy is emphasizing a team-based model. CSIERT encourages schools to have active five- to six-person teams, including one parent, to mobilize staff and implement the program. School districts are also encouraged to develop a district-wide indoor air quality management plan and structure that can be integrated into existing district efforts, such as a district health and safety committee.

## More Information

Connecticut Department of Public Health's School Environment site: [www.ct.gov/dph/schools](http://www.ct.gov/dph/schools)

Connecticut Tools for Schools Program website: [www.csiert.tfsiaq.com/index.html](http://www.csiert.tfsiaq.com/index.html)

# Kentucky Case Study

## Kentucky Green and Healthy Schools (KGHS)

### Background

Kentucky Green and Healthy Schools (KGHS) began in 2007 as a joint project between the Kentucky Environmental Education Council and the Kentucky Department of Education. The voluntary program encourages students and teachers to evaluate the built and natural environment, with an emphasis on conservation, waste reduction, and environmental health.

### The Program

KGHS is a student-centered program that encourages students and teachers to implement projects to improve the health, safety, and sustainability of their school. Schools are responsible for their own coordination and usually a “lead teacher” assumes responsibility for the school’s program. KGHS program activities are completed either after school or as part of a classroom curriculum. In addition to student-teacher collaboration, maintenance staff and janitors are often involved, especially with projects concerning energy, waste management, and green spaces.

KGHS offers nine categories for potential projects:

- Energy,
- Green spaces,
- Hazardous chemicals,
- Health and safety,
- Indoor air quality,
- Instructional leadership,
- Solid waste,
- Transportation, and
- Water quality.

Each of the nine categories has a corresponding list of approximately 20 questions concerning how the school handles each particular issue. The students’ answers to these questions help them decide what areas in the school need improvement. Students submit their proposed projects on the KGHS website and the KGHS office provides tools and support for students and teachers as they implement their projects. KGHS also offers awards to students (e.g., plaques, flags) as an incentive to complete their projects.

Conducting outreach to, and communicating with, teachers has been the most effective way of marketing the program. KGHS attends various teacher conferences and publishes a newsletter with updates and information on the program. KGHS offers professional development opportunities to train teachers, and can tailor the training by content area, grade level, or specific category if they know what the school is interested in. In addition to teacher training, KGHS requires schools new to the program to complete a 30 minute website training and sign a pledge form.

### Lessons Learned

- Educate and find ways to involve students in environmental health issues encountered at their schools.
- Identify your target audiences and tailor outreach and training to their specific needs.

### More Information

Kentucky Green and Healthy Schools (KGHS) Program website:

[www.greenschools.ky.gov](http://www.greenschools.ky.gov)

# Kentucky Case Study

## Kentucky Energy Efficiency Program for Schools (KEEPS)

### Background

The Kentucky Energy Efficiency Program for Schools (KEEPS) was launched in 2006 as a pilot program to test the idea of providing on-site energy efficiency technical assistance to school districts and higher education institutions. The pilot program was funded by the Kentucky Department for Energy Development and Independence and administered by the Kentucky Pollution Prevention Center at the University of Louisville J.B. Speed School of Engineering. Active pilot participants realized substantial cost savings through improved energy performance.

### The Program

In April 2008, Kentucky Revised Statute 160.325 was signed into law as an unfunded mandate requiring all 174 Kentucky public school district boards of education to enroll in KEEPS by January 2010. The statute also required Kentucky public school boards of education to report data on annual energy usage, costs, and energy saving measures to the Kentucky Pollution Prevention Center through KEEPS by December 1 of each year beginning in 2011. School districts submit this information to KEEPS using a KEEPS Energy Management Report, which considers 62 energy performance factors, including energy consumption, cost, behavior changes, number of ENERGY STAR appliances, and current contracts for energy efficiency, among others. A summary of this data is compiled on an annual basis into a KEEPS Status Report, which is published each January and submitted to the Legislative Research Commission

KEEPS partners with the following organizations:

- ★ KGHS
- ★ Kentucky National Energy Education Development (NEED) Project
- ★ Kentucky School Boards Association
- ★ Kentucky School Plant Management Association

KEEPS follows the seven-step framework outlined in ENERGY STAR's Guidelines for Energy Management:

- Step 1: Make the commitment
- Step 2: Assess performance
- Step 3: Set goals
- Step 4: Create an action plan
- Step 5: Implement the plan
- Step 6: Evaluate progress
- Step 7: Recognize achievements

and the Kentucky Department for Energy Development and Independence.

KEEPS is marketed as a fiscal program that saves school districts money. The program provides one-on-one meetings, workshops, and site visits designed to

help school districts recognize energy efficiency opportunities and potential financial savings. This approach has proven successful even in coal-producing counties where environmental issues, particularly energy efficiency, can be sensitive subjects. The team of KEEPS regional coordinators, engineers, and energy managers leverage ENERGY STAR's seven-step Guidelines for Energy Management as the structure for delivering program services and helping school districts establish their energy management programs.

KEEPS developed a series of 26 self-guided, online Energy Management Toolkits, which include of 229 free downloadable toolkit resources, to provide guidance for school district energy teams to progress through the seven-step process at their own pace. Several of these resources were beta-tested by school district energy managers and energy teams.

KEEPS engineers and energy managers provide on-site energy efficiency assessments and utility bill analyses of school district facilities and provide training to district energy managers so they can conduct their own assessments and analyses.

The KEEPS Awards and Recognition Program acknowledges the success of school district energy management programs that reach milestones through the seven-step ENERGY STAR energy management framework. The progressive awards—Stewardship, Champion, and Leadership—are based on documented achievements that illustrate the progress of the energy programs.

KEEPS communications and outreach efforts include the following:

- The KEEPS website ([www.kppc.org/KEEPS](http://www.kppc.org/KEEPS)) serves as the primary mechanism to deploy information about services and resources available, including toolkits, recorded webinars, and publications.

Since the mandate, all 174 Kentucky school districts have enrolled in KEEPS and adopted school-board approved energy policies. Of the 174 districts:

- ★ 166 have been actively involved in KEEPS leadership meetings
- ★ 163 established energy performance tracking standards
- ★ 133 established cross-functional energy teams that meet regularly
- ★ 124 developed communication plans to raise awareness about district-wide energy-saving initiatives
- ★ 85 identified energy performance goals
- ★ 62 implemented energy management action plans
- ★ 47 have earned KEEPS energy management awards

- The *KEEPS Moving Forward* monthly e-newsletter includes a “Kudos and Newsmakers” section that highlights success stories.
- KEEPS-sponsored training, workshops, and events offer peer-to-peer networking and mentoring opportunities that allow school districts to share ideas and offer guidance on implementing best energy management practices.

## Program Highlights

- In 2009, fewer than 10 Kentucky school districts were ENERGY STAR partners. That number has since grown to 127—an eleven-fold increase in participation. Kentucky has the highest percentage of K-12 ENERGY STAR partners (73%) in the country.

- Of the 1,400 K-12 schools in Kentucky, KEEPS has performed more than 190 on-site energy assessments and identified a total potential reduction in energy consumption of 212,781 million Btu per year representing avoided energy costs of \$3,306,000.

### Lessons Learned

- Establish a common message for your program and clearly define the program benefits and resources to school districts.
- Maintain frequent contact with school districts to provide program updates, technical assistance, and other information of benefit.
- Provide training to all program staff with the same goals in mind.
- Use feedback from participants in pilot projects or schools and school

districts with successful programs. Their successes and lessons learned will help your program evolve and improve.

- School districts that are made aware of the energy and cost savings of other districts realized through energy management program implementation are likely to follow suit.
- To achieve long-term sustainable results, school districts must embrace behavioral changes that promote best energy management practices in day-to-day operations.

### More Information

Kentucky Energy Efficiency Program for Schools (KEEPS) website: [www.kppc.org/KEEPS](http://www.kppc.org/KEEPS)

# Minnesota Case Study

## Minnesota: Model Indoor Air Quality Program for Schools

### Background

In 1997, a change was made to Minnesota Statute 123B.57 requiring all schools applying for health and safety funding to develop a health and safety program that includes an indoor air quality management plan. The Minnesota Department of Health recommended schools use EPA's Indoor Air Quality (IAQ) Tools for Schools program as a basis for developing their indoor air quality plans. The 2011 Legislative Session amended Minnesota Statute 123B.57 to require school boards adopt a health and safety policy that includes provisions for implementing a health and safety program that complies with health, safety, and environmental regulations and best practices, including indoor air quality management.

### The Program

Minnesota's indoor air quality best practices include having an indoor air quality coordinator and completing three IAQ Tools for Schools checklists (i.e., walk-through, ventilation, and maintenance) every year. Each school district is responsible for identifying what indoor air quality issues need to be addressed within the district, and must have an indoor air quality plan approved every year by its school board. The Minnesota Department of Health does not dictate what additional policies school districts must follow, but focuses on providing education and technical assistance for ventilation problems, mold

and moisture, cleaning products, radon, and building maintenance, to name a few. The Minnesota Department of Health also offers complete indoor air quality coordinator trainings every year.

From 2000 to 2006, the Minnesota Department of Health received a grant from EPA Region 5 to fund evaluation efforts. Each year, the agency completed a yearly survey of every school district in the state asking specifically about each school's indoor air quality program and its progress. The Minnesota Department of Health used the data to track how many schools were engaging in various indoor air quality projects. In addition, the agency completed 20 on-site reviews at randomly selected districts to determine whether they were developing and implementing indoor air quality plans according to the state's best practices. The Minnesota Department of Health also investigated the impact of implementing an indoor air quality program. The agency measured allergens and CO<sub>2</sub> (a surrogate for ventilation rates) and surveyed school staff about their perceptions of the school's indoor air quality both before the program and one year after the program was implemented. The agency reported measurable changes in the schools studied. Details regarding the Minnesota Department of Health's evaluation efforts can be found in published reports (e.g., Tranter et al., 2009 in the *Journal of Occupational and Environmental Hygiene* Vol. 6).

## Program Highlights

- Since 1997, more than 90% of Minnesota's school districts have adopted an indoor air quality program. Minnesota has also established several other school-specific laws, including a mercury instrument ban and a school bus anti-idling law.

## Lessons Learned

- Every school is unique. Meet with school officials to find out what issues they need help addressing.
- Work with state agencies and the private sector. Each has unique expertise to contribute toward an indoor air quality (or environmental health) program.
- Statewide training is key to successful program implementation.

Minnesota's indoor air quality program and school environmental health efforts are coordinated by the Minnesota Department of Health in cooperation with the Minnesota Department of Education, Minnesota Department of Agriculture, and the Minnesota Pollution Control Agency.

## More Information

Minnesota Department of Health Indoor Air Quality in Schools website: [www.health.state.mn.us/divs/eh/indoorair/schools/index.html](http://www.health.state.mn.us/divs/eh/indoorair/schools/index.html)

# New Hampshire Case Study

## New Hampshire Partners for Healthy Schools

### Background

In 2007, the New Hampshire Department of Education partnered with the New Hampshire Department of Health and Human Services, the New Hampshire Department of Environmental Services, the New Hampshire Coalition for Occupational Safety and Health, and Breathe New Hampshire to launch a Healthy Schools Pilot Project to help schools address indoor air quality issues. The partnership provided technical assistance to two schools to help implement environmental health programs based on EPA's IAQ Tools for Schools program.

### The Program

New Hampshire's school environmental health program builds on the successes and lessons learned from the pilot projects conducted in 2007. Each fall, the program begins work with a new set of schools, identified through the New Hampshire Department of Education, in need of assistance with environmental health issues. Participating schools form a committee made up of key staff (e.g., principals, teachers, nurses, and facilities managers) that is in charge of developing work plans for their school and encouraging buy-in at the school level. The partnership provides free assessment, training, technical assistance, and mentoring to address environmental needs identified by the schools.

Outreach and marketing has played a key role in expanding and improving New Hampshire's program. In the beginning,

the partnership had to aggressively market the program so schools understood how the program worked. The partners attended conferences and hosted workshops and trainings to attract interest and encourage participation. Through their outreach and marketing campaign the partnership has also gained new partners, including the New Hampshire Department of Agriculture and insurance providers. These new partners have enabled the program to expand its reach to address new areas of environmental health, including integrated pest management, clutter, and general safety issues.

New Hampshire's school environmental health program has also benefited from the passage of new state laws. Program partners and one of the pilot schools' principals testified at legislative hearings for two proposed bills requiring school boards to develop a policy to address air quality issues in schools. Both bills passed in 2010 and now all New Hampshire schools are required by law to complete an annual environmental health and safety checklist.

### Program Highlights

- Of the 474 schools in New Hampshire, over 160 have turned in the environmental health and safety checklist for 2011.

### Lessons Learned

- Seek professional opinions on school environments to better understand the environmental health issues you want to address.

- Develop a work plan and review it yearly. Taking the time to think critically about your work will help when communicating about the program and its benefits.
- Consistently communicate with your partners. Continuous communication and collaboration will help keep partners engaged and moving forward with the program.

- Gaining buy-in and support from school administrators (e.g., superintendent and principal) is a critical step for working effectively with schools and school districts.

### More Information

New Hampshire Health School Environments Program website: [www.nhhealthyschoolenvironments.org/index.html](http://www.nhhealthyschoolenvironments.org/index.html)

# Rhode Island Case Study

## Rhode Island: Financing Without Funding

### Background

Rhode Island has passed several laws that address environmental health in schools:

- In 1964, the Rhode Island Department of Health and the Rhode Island Department of Elementary and Secondary Education (RIDE) collaborated on legislation entitled *Rules and Regulations for School Health Programs*. The legislation prescribes minimum requirements to maintain safe and healthy schools in Rhode Island, and contains statutory requirements relating to environmental health issues including asbestos, pesticide use, and lead. The law has been amended several times, most recently in January 2009.
- In 2007, Rhode Island passed a set of school construction regulations that require all schools receiving construction funding to implement an indoor air quality management plan. These regulations also require the use of the Northeast Collaborative for High Performance Schools protocol, which has a strong focus on indoor air quality.
- Rhode Island General Law §16-21-7 requires all Rhode Island schools have a school health program that adheres to the All school health programs must be approved by the Commissioner of Elementary and Secondary Education and the Director of Health.

### The Program

Rhode Island began its school health program in 2007 in response to the school construction regulations that were passed. The program is modeled after EPA's IAQ Tools for Schools program and places an emphasis on indoor air quality. Rhode Island uses the Northeast Collaborative for High Performance Schools protocol to address environmental health in school construction and design. The protocol identifies 18 indoor environmental quality prerequisites that address issues such as ventilation, chemical management, and integrated pest management. Rhode Island encourages schools to use the National Collaborative for High Performance Schools operations manual and report card to implement and evaluate their school health programs. In addition, schools are required to form green teams comprised of school personnel to oversee program implementation and environmental education efforts.

Rhode Island's school health program operates without support from grant funding. As a result, RIDE has developed a multi-stakeholder, community approach to implement and sustain the program without formal funding. RIDE has teamed up with the Rhode Island Department of Health, the NEED project, non-profit organizations, universities, and private sector businesses to create outreach materials and provide training. For example:

- NEED works with Rhode Island schools to develop place-based energy programs.
- Several non-profits, including the Apeiron Institute and Small Feet, provide direct support to the schools' green teams.
- The University of Rhode Island Energy Fellows program helps school districts complete ENERGY STAR's Portfolio Manager.
- RIDE has hired interns to develop a variety of outreach and educational materials to help schools and school districts implement their school health programs.
- With a broad coalition of stakeholders, RIDE has helped plan an annual sustainable schools summit to promote healthy learning environments and to provide resources to integrate sustainability practices into school curriculum and culture.

RIDE is committed to sustaining Rhode Island's school health program through on-going communication efforts. The agency holds workshops and forums for school districts and meets with districts on a daily basis to discuss program progress and relevant concerns. RIDE is also heavily involved in school renovation work and construction discussions.

### Program Highlights

- As of January 2012, ten school districts have committed to implementing Rhode Island's school health program.

### Lessons Learned

- The broad-based support made possible through community collaboration has enabled RIDE program staff to do a lot with little or no budget.

Members of a school green team can include:

- ★ School administrators
- ★ Teachers
- ★ School facilities staff
- ★ School nurses
- ★ Students
- ★ Parents
- ★ Community-based health professionals
- ★ Business representatives

- Be willing to learn from stakeholders and collaborating organizations. Their networks can lead to additional organizations and programs that are willing to contribute.
- Provide venues and methods for communicating with stakeholders and the community (i.e., forums, meetings, and listservs).
- Use a "green team" concept to bring together relevant school staff and community members to create a sense of ownership and ensure a sustainable program.

### More Information

Rhode Island Department of Elementary and Secondary Education (RIDE)—Funding School Construction: [www.ride.ri.gov/Finance/Funding/construction/default.aspx](http://www.ride.ri.gov/Finance/Funding/construction/default.aspx)

Rhode Island's Coordinated School Health Program (CSHP): <http://www.ride.ri.gov/HighSchoolReform/CSH/default.aspx>

# Washington Case Study

## Washington School Environmental Health and Safety Program (SchEH&S)

### Background

The State of Washington pioneered school environmental health and safety, adopting the State Board of Health Rule for Primary and Secondary Schools in 1955. This rule established minimum environmental health and safety standards for education facilities (e.g., siting, lighting, ventilation, noise, heating, and safety), and requires local health jurisdictions (LHJs) to review and approve plans for new and remodeled schools and conduct pre-opening inspections. LHJs also were required to inspect schools annually until 1971 when the rule was amended to require “periodic” inspections. Now the frequency of inspections depends on local resources.

In the mid-1990s, the Washington State Department of Health and the Office of the Superintendent of Public Instruction brought together LHJs, state and federal agencies, school associations, school administrators, nurses, risk managers, and facility maintenance and operations staff from school districts across the state to develop one set of guidelines on health and safety rules and best practices for K-12 schools: the *Health and Safety Guide for K-12 Schools in Washington* (2000, 2003, 2012). At the same time, tighter school construction and lower ventilation rates, in addition to construction issues around the state, raised concerns about mold problems and indoor air quality. The Washington Department of Health worked with its partners to obtain EPA IAQ Tools for Schools grants; conduct indoor air quality and mold trainings for school and LHJ staff; and produce the *School IAQ Best*

*Management Practices Manual (1995, 2003) and Responding to IAQ Concerns in our School (2005).*

### The Program

Washington’s Department of Health School Environmental Health and Safety (SchEH&S) Program activities revolve around three key themes: (1) partnerships; (2) technical assistance and training; and (3) workshops and outreach.

Washington Department of Health School Environmental Health and Safety partners include:

- ★ Council of Educational Facilities Planners International
- ★ Northwest Pediatric Environmental Health Specialty Unit
- ★ Office of the Superintendent of Public Instruction
- ★ Washington Association of Maintenance and Operations Administrators
- ★ Washington Association of School Administrators
- ★ Washington Association of School Business Officials
- ★ Washington Education Association
- ★ Washington State Parent Teachers Association
- ★ Washington State School Directors’ Association
- ★ Washington State University Extension and Energy Programs

## Partnerships

The Department of Health SchEH&S Program has fostered partnerships with state and federal agencies, school-centered organizations, and risk managers. It participates on key committees such as the Office of the Superintendent of Public Instruction's School Facilities Technical Advisory Committee and School Safety Center Advisory Committee. The program also provides liaisons between state agency workgroups and schools. One such collaboration involves working with the Urban Pest Education Strategy Team to provide resources and training on integrated pest management. Another successful collaboration is with the Office of the Superintendent of Public Instruction and school groups on the Washington Sustainable Schools program, which includes promoting voluntary guidelines for school construction that address energy efficiency, environmental sustainability, water use, natural day lighting, and indoor air quality.

## Technical Assistance and Training

The Department of Health SchEH&S Program provides technical assistance to LHJs and school staff (e.g., risk managers, maintenance and operations, custodians, nurses, and administrators) on environmental health and safety issues. The program works with school nurses and custodians to implement best practices for infection control in schools, including proper hand washing, cleaning, and disinfecting. The program supports and promotes King County's Local Hazardous Waste Management Rehab the Lab Program, as well as other efforts made by state agencies and Educational Service Districts to provide technical assistance and training on safe chemical management, lab safety, and chemical cleanouts in schools. The Department of Health SchEH&S Program also provides interpretation and technical support on the State Board of Health school rule and the *Health and Safety Guide for K-12 Schools in Washington* guidance.

## Workshops and Outreach

The Department of Health SchEH&S Program promotes school environmental health and safety through presentations to, and participation in, various school and public health associations. The program holds annual fall workshops around the state that bring LHJs and school staff together to network and receive information on school environmental health and safety. The program is a partner in the Washington State CDC funded Coordinated School Health Program, another means of disseminating environmental health information to schools. Newsletters, listservs, and the Department of Health SchEH&S website are also used as outreach tools to reach target audiences.

## Program Highlights

- Through education and training, schools have become more knowledgeable concerning ventilation and indoor air quality. As a result, there has not been a major school shut down for some time.

## Lessons Learned

- Work with and develop partnerships with a variety of agencies and organizations to enhance program implementation and reach schools more effectively.
- Provide training and outreach to schools empowers them to deal with environmental health issues before they have a negative impact on the school environment.
- Use a variety of ways to disseminate environmental health information to schools, school districts, and school groups to ensure you reach all target audiences.

## More Information

Washington Department of Health School Environmental Health and Safety website: [www.doh.wa.gov/CommunityandEnvironment/Schools/EnvironmentalHealth.aspx](http://www.doh.wa.gov/CommunityandEnvironment/Schools/EnvironmentalHealth.aspx)

# Wisconsin Case Study

## Wisconsin Green and Healthy Schools

### Background

In 2002, the Wisconsin Department of Natural Resources adopted a model that integrated many of its existing school environmental health and safety programs as a way to streamline its work with schools. The result was a voluntary, web-based certification program designed to directly support all Wisconsin K-12 schools striving for healthy, safe, and environmentally friendly learning environments.

### The Program

The Wisconsin Department of Natural Resources launched its Green Schools program in 2003, and in 2004 teamed up with the Wisconsin Department of Public Instruction to create the Wisconsin Green and Healthy Schools program. School participants complete a three step certification process covering areas including: waste and recycling, energy, water, facilities, healthy lifestyle, transportation, indoor air quality, chemical management, integrated pest management, and community involvement. As part of the certification process, schools conduct comprehensive environmental audits of their facilities and practices, and identify actions the school can take to become greener and healthier. Once a school has fulfilled the minimum criteria of the program and has made improvements to areas identified in the audit, the school can apply to become a Wisconsin Green and Healthy School. Schools can continue to improve by participating in the Reaching Higher step, which entails completing assessments and taking actions in topic areas not addressed in the original Green and Healthy Schools application.

The Wisconsin Green and Healthy Schools program offers a series of workshops to assist school staff, teachers, and administrators with adopting the program in their schools. The workshops provide an in-depth introduction to the program, connect area resources (e.g., businesses, non-profits, and local government) with schools, and help individual schools develop a plan for making their school green and healthy. The program also promotes school participation through its website and newsletters, highlighting the flexibility and self-pacing of the program and some of the program's benefits (e.g., energy and money savings and improved student learning and health).

### Program Highlights

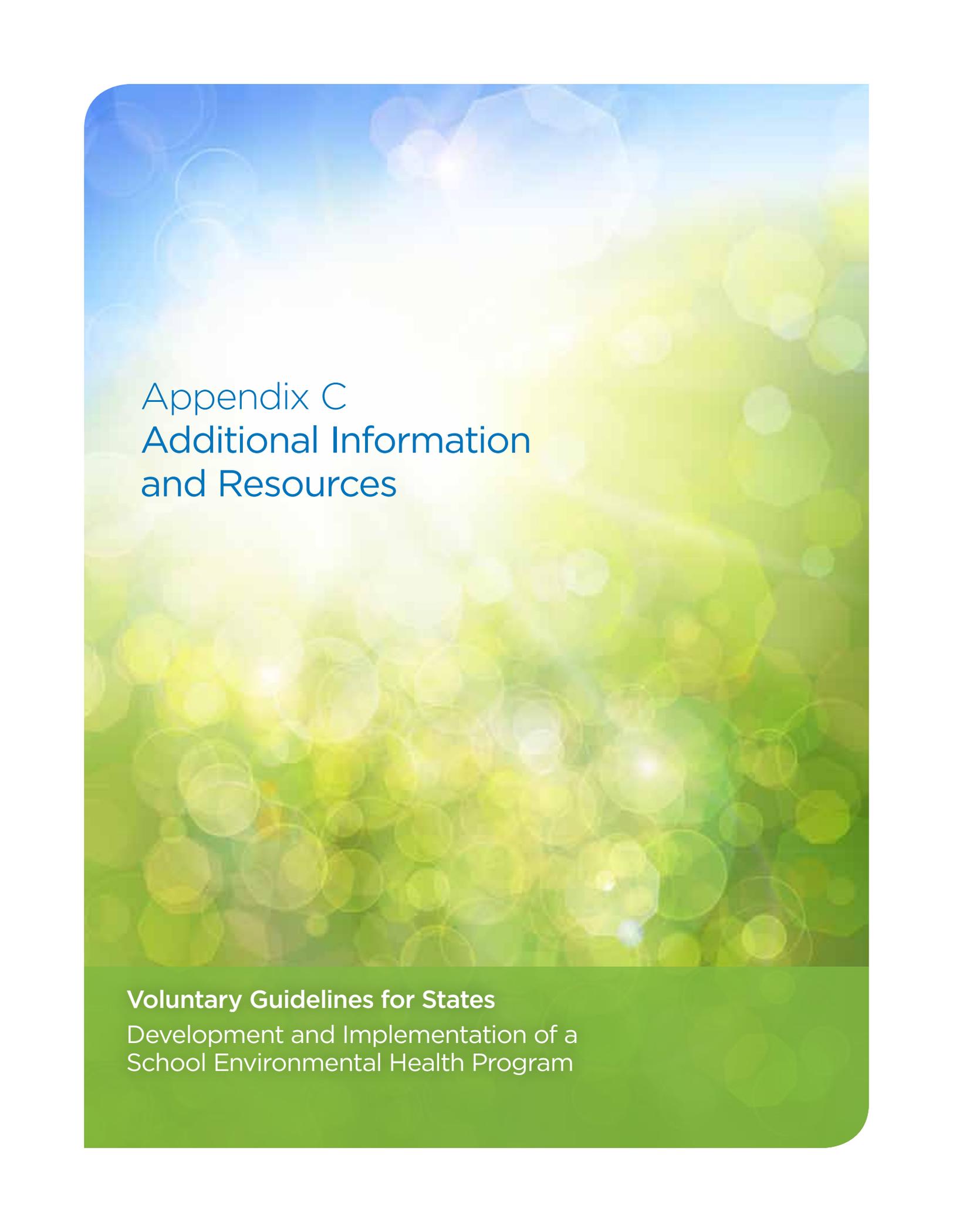
- The Wisconsin Green and Healthy Schools program has 140 participating schools. Of those, 32 have completed all three steps of the program and 4 are participating in the Reaching Higher step.

### Lessons Learned

- The partnership between the Wisconsin Department of Natural Resources and the Wisconsin Department of Public Instruction brings credibility to the program and makes schools more willing to participate.
- Integrating many schools programs into one overarching program is appealing to schools with limited funding and resources.
- Promote the benefits of program involvement. Emphasizing cost and energy savings is important in a tight economy.

### More Information

Wisconsin Green and Healthy Schools program website: [dnr.wi.gov/greenandhealthyschools](http://dnr.wi.gov/greenandhealthyschools)



Appendix C  
Additional Information  
and Resources

**Voluntary Guidelines for States**

Development and Implementation of a  
School Environmental Health Program

# Additional Information and Resources

## EPA Children's Health Protection and Programs

EPA Region 8's [Clean, Green, and Healthy Tribal Schools](#) website

EPA's [Children's Environmental Health and Disease Prevention Research Centers](#) (with the National Institute of Environmental Health Sciences) website

EPA's [Children's Health Protection](#) website

EPA's [Healthy School Environments](#) website

EPA's [Healthy School Environment Resources](#) website

EPA's [Indoor Air Quality \(IAQ\) National Schools Network](#) website

EPA's [Indoor Air Quality \(IAQ\) School Champions](#) website

EPA's [Regional Office Contacts](#)

## K-12 School Compliance, Policies, and Standards

[Energy Independence & Security Act of 2007](#)

EPA Region 2's [Environmental Compliance and Best Management Practices: Guidance Manual for K-12 Schools](#)

National Institute for Occupational Safety and Health's (NIOSH) [Safety Checklist Program for Schools](#)

Occupational Safety and Health Administration's [Principal Emergency Response and Preparedness Requirements and Guidance](#)

Rehabilitation Act of 1973 section 504, subpart D: [Preschool, Elementary, and Secondary Education](#)

Beyond Pesticides' [State and Local School Pesticide Policies](#)

[Campus Environmental Resource Center](#) (Campus ERC) is a library of resources that support campus environmental performance improvement and help visitors better understand environmental regulations. Although Campus ERC is designed for use by colleges and universities, K-12 school districts might find some of its resources helpful.

[Environmental Law Institute](#) website

Environmental Law Institute's [Green Cleaning in Schools: Developments in State Policy](#) website

Environmental Law Institute's [Indoor Environments and Green Buildings Policy Resource Center](#)

## Disclaimer for External Websites

Any NON-FEDERAL websites or Web links included in this document are provided for informational purposes only. The U.S. Environmental Protection Agency (EPA) does not endorse any of these entities or their services. In addition, EPA does not guarantee that any linked, external websites referenced in this document comply with section 508 (accessibility requirements) of the Rehabilitation Act.

Environmental Law Institute's [School Indoor Air Quality: State Policy Strategies for Maintaining Healthy Learning Environments](#) (available for download)

The National Association of State Boards of Education [State School Healthy Policy Database](#) is a comprehensive set of laws and policies from the 50 states on more than 40 school health topics. The policies in the database are organized into six broad categories: curriculum and instruction, staff, health promoting environment, student services, accommodation, and coordination/implementation.

National Conference of State Legislatures' [Environmental Health Legislation and Statutes Databases](#)

## Assessment Tools

EPA's [Healthy School Environments Assessment Tool \(HealthySEATv2\)](#)

Centers for Disease Control and Prevention's (CDC) [School Health Profiles](#)

Rhode Island's [Northeast Collaborative for High Performance Schools High Performance Scorecard](#)

## National or State Awards Programs

U.S. Department of Education [Green Ribbon Schools Recognition Award](#)

Florida's [Governor Serve to Preserve Green Schools Award](#)

Texas's [Green Ribbon Schools Program](#)



## Practice Effective Cleaning and Maintenance

EPA's Design for the Environment program helps consumers, businesses, and institutional buyers identify cleaning and

other products that perform well, are cost effective, and are safer for the environment. A list of products that meet Design for the Environment's stringent criteria for health and environmental safety can be found on the [Design for the Environment Product Web page](#).

EPA's [Design for the Environment](#) website

EPA's Environmentally Preferable Purchasing Program: [Cleaning](#)

EPA's [Greening Your Purchase of Cleaning Products: A Guide for Federal Purchasers](#)

EPA's [IAQ Tools for Schools Action Kit](#)

EPA's Safe Chemical Management in Schools [Green Cleaning Fact Sheet](#)

CDC/NIOSH's [Prevention of Occupational Asthma](#) website

California Department of Public Health's [Cleaning for Asthma Safe Schools Project](#)

Illinois Green Cleaning Legislation's [Public Act 095-0084](#)

Missouri's [Green Cleaning Guidelines and Specifications for Schools](#)

New York's [Green Cleaning Program](#) website

New York's Green Cleaning Program Approved [Green Cleaning Products List](#)

The Collaborative for High Performance Schools (CHPS) Best Practices Manual for Maintenance and Operations: available for [download](#) on the CHPS website.

Healthy Schools Campaign [Green Clean Schools](#) website

Healthy Schools Network's [Cleaning for Healthy Schools Toolkit](#)

National Clearinghouse for Educational Facilities' [Resource List for School Cleaning and Maintenance Practices](#)

U.S. Green Building Council's [Leadership in Energy and Environmental Design for Existing Buildings: Operations and Maintenance](#) addresses whole-building

cleaning and maintenance issues (including chemical use) and exterior maintenance programs.

**Green Seal** is a non-profit organization that develops life-cycle based sustainability standards for products, services, and companies and offers third-party certification for those that meet the criteria in the standard.

**Ecologo** was founded in Canada in 1988 and is a North American environmental standard and certification mark. Ecologo's standards address multiple environmental attributes throughout the life cycle of a product or service, and have been verified by a third-party auditor.



### Prevent Mold and Moisture

EPA's [Flood Cleanup](#) website

EPA's [Molds and Moisture](#) website

EPA's [Mold Remediation in Schools and Commercial Buildings](#) website

CDC's [Mold](#) website

University of Connecticut Health Center's [Guidance for Clinicians on the Recognition and Management of Health Effects Related to Mold Exposure and Moisture Indoors](#)



### Reduce Chemical and Environmental Contaminant Hazards

EPA's fact sheet: [Lead in Drinking Water Coolers](#)

EPA's Guidance on [Assessing Outdoor Air Near Schools](#)

EPA's Guidance on [Testing Schools and Child Care Facilities for Lead in the Drinking Water](#)

EPA Region 8's [Hazardous Waste Management for School Laboratories and Classrooms](#)

EPA Region 8's [Idle Free Schools Toolkit](#)

EPA Region 8's [Pollution Prevention Measures for Safer School Laboratories](#)

EPA's [3Ts for Reducing Lead in Drinking Water](#) manual

EPA's [Academic Laboratories Rule](#)

EPA's [Asbestos in Schools](#) website

EPA's [Clean School Bus USA](#) website

EPA's [Community Action for a Renewed Environment Program](#)

EPA's [Current Drinking Water Regulations](#) website

EPA's [Design for the Environment Labeled Products and Partners](#)

EPA's [Drinking Water in Schools and Child Care Facilities](#) website

EPA's [Environmentally Preferable Purchasing Program](#)

EPA's [Guidance and Tools for Drinking Water in Schools and Child Care Facilities](#)

EPA's [Hazardous Waste](#) website

EPA's [IAQ Reference Guide Appendix G: Radon](#)

EPA's [IAQ Tools for Schools Action Kit](#)

EPA's [Lead](#) website

EPA's [List of Drinking Water Contaminants and their Maximum Contaminant Levels](#)

EPA's [Mercury](#) website

EPA's [Mercury in Schools Case Studies](#)

EPA's [National Clean Diesel Campaign](#) website

EPA's [National Idle-Reduction Campaign](#) website

EPA's [National Primary Drinking Water Regulations](#) website

EPA's [Polychlorinated Biphenyls \(PCBs\)](#) website

EPA's [PCB in Caulk Schools Fact Sheet](#)

EPA's [Proper Maintenance, Removal, and](#)

*Disposal of PCB-Containing Fluorescent Light Ballasts: A Guide for School Administrators and Maintenance Personnel*

EPA's Radon website

EPA's Radon in Schools website

EPA's Reduce Exposure to Environmental Tobacco Smoke website

EPA's Safe Chemical Management in Schools website

EPA's Safe Chemical Management in Schools Workbook: Building Successful Programs to Address Chemical Risks in Schools

EPA's Smoke-Free Homes website

EPA's Toolkit for Safe Chemical Management in K-12 Schools

EPA's Wastewater Management website

AIRNow's Air Quality Index website

AIRNow's School Flag Program

Agency for Toxic Substances and Disease Registry's ToxFAQs website

Consumer Product Safety Commission/NIOSH's School Chemistry Laboratory Guide

NIOSH's Hazardous Waste Self-Inspection Checklist for Schools

Occupational Safety and Health Administration's Occupational Exposure to Hazardous Chemicals in Laboratories Standard

Colorado regulations for inventory of laboratory chemicals: *RULES AND REGULATIONS GOVERNING SCHOOLS IN THE STATE OF COLORADO 6 CCR 1010-6*

King County, Washington's Local Hazardous Waste Management Program Resources for Schools

King County, Washington's Local Hazardous Waste Management Program School Chemical List

King County, Washington's Rehab the Lab Less Toxic Chemistry Labs

Maryland's Science Safety Manual *Chemicals: Managing, Handling, and Disposing*

Nebraska's Department of Environmental Quality School Chemicals and Disposal Guidance

San Antonio, Texas's Northeast Independent School District Air Quality Health Alert Program

Washington D.C.'s Ballou High School Mercury Spill Case Study



## Ensure Good Ventilation

EPA's Guidance for Indoor Air Quality in Large Buildings

EPA's Asthma Webpage: Asthma Triggers

EPA's IAQ Tools for Schools website

EPA's IAQ Tools for Schools Action Kit

EPA's IAQ Tools for Schools: Benefits of Good Indoor Air Quality

EPA's IAQ Tools for Schools: Case Studies

EPA's IAQ Tools for Schools: Framework for Effective Indoor Air Quality Management

EPA's IAQ Tools for Schools: Heating, Ventilation, and Air Conditioning Systems

EPA's IAQ Tools for Schools: School Advanced Ventilation Engineering Software

EPA's Ozone Generators that Are Sold as Air Cleaners website

EPA's Residential Air Cleaners: A Summary of Available Information website

Charlotte-Mecklenburg Schools' Indoor Air Quality Program and Environmental Stewardship Initiative

Connecticut's Indoor Air Quality Law

Connecticut's Tools for Schools Program

Indiana's Department of Health [School Indoor Air Quality Policy](#)

New Jersey's Public Employee Occupational Safety and Health [Indoor Air Quality Standard](#)

Texas's [Voluntary Indoor Air Quality Guidelines for Government Buildings](#) (including public schools)

American Society of Heating, Refrigerating, and Air Conditioning Engineers' Standard 62.1-2010: [Ventilation for Acceptable Indoor Air Quality](#)

Asthma and Allergy Foundation of America's [State Honor Roll of Asthma and Allergy School Policies](#)

National Education Association Health Information Network's: [K-12 Indoor Air Quality Lesson Plans](#)



## Prevent Pests and Reduce Pesticide Exposure

EPA's [Integrated Pest Management \(IPM\) in Schools](#) website

EPA's Pesticides [A Backyard Activity Book for Kids on Integrated Pest Management](#) website

EPA's Pesticides [Children are at Greater Risk from Pesticide Exposure](#) website

EPA's Pesticides [Information for Kids, Students, and Teachers](#) website

EPA's Pesticides [Topical and Chemical Fact Sheets](#) website

California's [School Integrated Pest Management](#) website

Florida's [School Integrated Pest Management](#) website

Los Angeles Unified School District's [Integrated Pest Management Policy](#)

Monroe County, Indiana's [School Integrated Pest Management Model](#)

New Jersey's [School Integrated Pest Management](#) website

North Carolina's [School Integrated Pest Management](#) website

Pennsylvania's [School Integrated Pest Management](#) website

Texas A&M's [School Integrated Pest Management](#) website

Washington State University's [School Integrated Pest Management](#) website



## New Construction and Renovation

EPA's [Healthy School Environment Resources: Financing](#)

EPA's [IAQ Design Tools for Schools](#) website

EPA's [IAQ Design Tools for Schools: Controlling Pollutants and Sources](#)

EPA's [IAQ Design Tools for Schools: High Performance Schools](#)

EPA's [IAQ Tools for Schools Renovation and Repair](#) website

EPA's [Lead Renovation, Repair, and Painting](#) website

EPA's [Lead Safe Certification Program](#)

EPA's [Renovation, Repair, and Painting Rule](#)

EPA's [Smart Growth and Schools](#)

EPA's [Voluntary School Siting Guidelines](#)

EPA's [WaterSense](#) website

EPA's [WaterSense Label](#)

EPA's [WaterSense Labeled Products](#)

EPA's [WaterSense Rebate Finder](#)

EPA's [ENERGY STAR for K-12 School Districts](#) website

EPA's [ENERGY STAR Building Upgrade Manual](#)

EPA's [ENERGY STAR Designed to Earn the ENERGY STAR](#)

EPA's ENERGY STAR [Energy Design Guidance](#)

EPA's ENERGY STAR [Federal High Performance Sustainable Buildings Checklist](#)

EPA's ENERGY STAR [Target Finder](#)

U.S. Department of Energy's Federal Energy Management Program: [Guidance for Sustainable Design](#)

U.S. Department of Energy's [National Best Practices Manual for Building High Performance Schools](#)

U.S. Green Building Council's [Center for Green Schools](#)

U.S. Green Building Council's [Leadership in Energy and Environmental Design for Schools](#)

[Collaborative for High Performance Schools \(CHPS\) website](#)

[Collaborative for High Performance Schools' CHPS Designed](#)

[Collaborative for High Performance Schools' CHPS Operations Report Card](#)

[Collaborative for High Performance Schools' CHPS Verified](#)

[Collaborative for High Performance Schools' CHPS Verified for Prefabricated Classrooms](#)

[Collaborative for High Performance Schools' High Performance Products Database](#)

[Collaborative for High Performance Schools' High Performance School Best Practices Manual](#)

[Green Building Initiative website](#)

Green Building Initiative's [Green Globes Program](#)

[International Code Council website](#)

International Code Council's [International Green Construction Code](#)

The Alliance for Healthy Homes' [Provisions found in model codes that address pest prevention and control](#)

[American Clearinghouse on Educational Facilities website](#)

[National Clearinghouse for Educational Facilities website](#)

[National Green Schools Coalition](#)

National Center for Educational Statistics' [Facilities Information Management: A Guide for State and Local Education Agencies](#)

National Center for Educational Statistics' [Forum Guide to Facilities Information Management: A Resource for State and Local Education Agencies](#)

NSF International's [Low Lead Plumbing Products Guide](#)

Sheet Metal and Air Conditioning Contractors' National Association's [IAQ Guidelines for Occupied Buildings Under Construction](#)



## Enhancing Classroom Comfort

EPA's [Proper Maintenance, Removal, and Disposal of PCB-Containing Fluorescent Light Ballasts: A Guide for School Administrators and Maintenance Personnel](#)

EPA's [SunWise Program website](#)

Department of Energy EnergySmart Schools Case Study's [Northern Guilford Middle School, Greensboro, North Carolina](#)

U.S. Green Building Council's Center for Green Schools [What Makes a School Green?](#)

Virginia's [Albemarle County Public Schools website](#)

Standard 12.60, "Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools," of the American National Standards Institute [Part 1: Permanent Schools](#)

Standard 12.60, "Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools," of the American National Standards Institute [Part 2: Relocatable Classrooms](#)

*Windows and Classrooms: A Study of Student Performance and the Indoor Environment*, California Energy Commission, Hescong Mahone Group, Inc. October 2003



## Energy and Water Efficiency

EPA Region 1's [Solar Power](#) website

EPA Region 3's [Rain Barrels](#) website

EPA's [Green Roofs](#) website

EPA's *Proper Maintenance, Removal, and Disposal of PCB-Containing Fluorescent Light Ballasts: A Guide for School Administrators and Maintenance Personnel*

EPA's [WaterSense](#) website

EPA's [WaterSense Educational Materials](#)

EPA's [WaterSense Kids](#) website

The ENERGY STAR information for [purchasing and procurement](#) is designed to assist procurement officials in smart purchasing decisions. Read about how the [United States Air Force](#) implemented ENERGY STAR purchasing and other measures to save \$15 million annually. Review other [case studies](#) and the key benefits of purchasing ENERGY STAR-qualified products.

[Energy Efficiency and Indoor Air Quality in Schools](#): A joint EPA working paper from ENERGY STAR and Indoor Air Quality (September 2003)

EPA's [ENERGY STAR for K-12 School Districts](#) website

EPA's [ENERGY STAR Guidelines for Energy Management](#)

EPA's ENERGY STAR [Guide to Energy Efficiency Competitions for Buildings & Plants](#)

EPA's ENERGY STAR [Kids Webpage](#)

EPA's ENERGY STAR [Low Carbon IT Campaign](#)

EPA's ENERGY STAR [Portfolio Manager: An Overview](#)

Department of Energy's Energy Efficiency and Renewable Energy [K-12 Lesson Plans and Activities](#)

Department of Energy's EnergySmart Schools [Guide to Operating and Maintaining EnergySmart Schools](#)

Colorado's Manitou Springs School District [Sustainability Management Plan](#)

[Kentucky's Energy Efficiency Program for Schools](#)

Lakota School District's [Facilities Upgrade Case Study](#)

Newtown, Pennsylvania's [Council Rock School District Case Study](#)

Alliance for Water Efficiency's [Promoting the Efficient and Sustainable Use of Water/ Schools K-12 Introduction](#)

The [International Facility Management Association Sustainability](#) website contains resources and information for facility management professionals on energy and water conservation, indoor environmental quality, purchasing, and waste/recycling.



## Training and Curricula

EPA's ENERGY STAR program provides no-cost training on a variety of topics related to energy efficiency in buildings, including K-12 schools. Visit [energystar.webex.com](http://energystar.webex.com) to view the continuously updated list and schedule of upcoming trainings.

[Classroom Earth](#) is an online resource designed to help high school teachers include environmental content in their daily lesson plans. Its resource library

offers websites, videos, and sample lesson plans. The website also features grants and funding opportunities, success stories, and professional development opportunities.

The [Green Education Foundation](#) provides curriculum and resources for K-12 students and teachers.

The [National Environmental Education Foundation](#) is a complementary organization to EPA, extending its ability to foster environmental knowledge across all segments of the American public. The foundation's programs offer opportunities to incorporate environmental health lessons into student curricula.

The [National Energy Education Development](#) project provides resources to educate teachers and students on the science of energy, renewable and nonrenewable sources of energy, electricity, transportation, and efficiency and conservation, among other topics. The National Energy Education Development's website offers curriculum guides and resources for teachers, as well as activities and information for students.

## Other Resources

EPA's [Food Waste](#) website

CDC's [Coordinated School Health](#) website

CDC's [2006 School Health Policies and Programs Study](#) overview

NIOSH's [Health Hazard Evaluation Program Pediatric Environmental Health Specialty Units](#)

The President's Task Force on Environmental Health Risks and Safety Risks to Children's [Coordinated Federal Action Plan to Reduce Racial and Ethnic Asthma Disparities](#)

[United States Department of Agriculture Cooperative Extension Offices](#) are good resources for educational materials.

Chicago, Illinois's [Academy for Global Citizenship](#) website

Chicago, Illinois's [Academy for Global Citizenship: Sustainability Handbook for Schools](#)

[Colorado's Coalition for Healthy Schools](#) website

Colorado Springs, Colorado School District 11 [ENERGY STAR Case Study](#)

Illinois Department of Public Health's [Healthy Schools for Healthy Learning](#) website

[Kentucky's Green and Healthy Schools](#) website

[Maryland's Association of Environmental and Outdoor Education](#)

Minnesota Department of Health's [School Related Initiatives and Programs](#)

Minnesota's [Statute 123B.57 Capital Expenditure; Health and Safety](#)

New Hampshire's [Partners for Healthy Schools](#) website

Rhode Island's [Department of Elementary and Secondary Education](#) website

Washington's [School Environmental Health and Safety](#) website

Wisconsin's [Green and Healthy Schools Program](#)

The [Green Schools Alliance](#) is a non-profit organization created by schools for schools to address environmental and climate challenges through the implementation of sustainable, energy-smart solutions. The Green Schools Alliance offers programs and resources to help

schools set goals, measure progress, share best practices, and inspire change. The alliance's website features a Web page for students that offers ways to take action on environmental issues facing their schools.

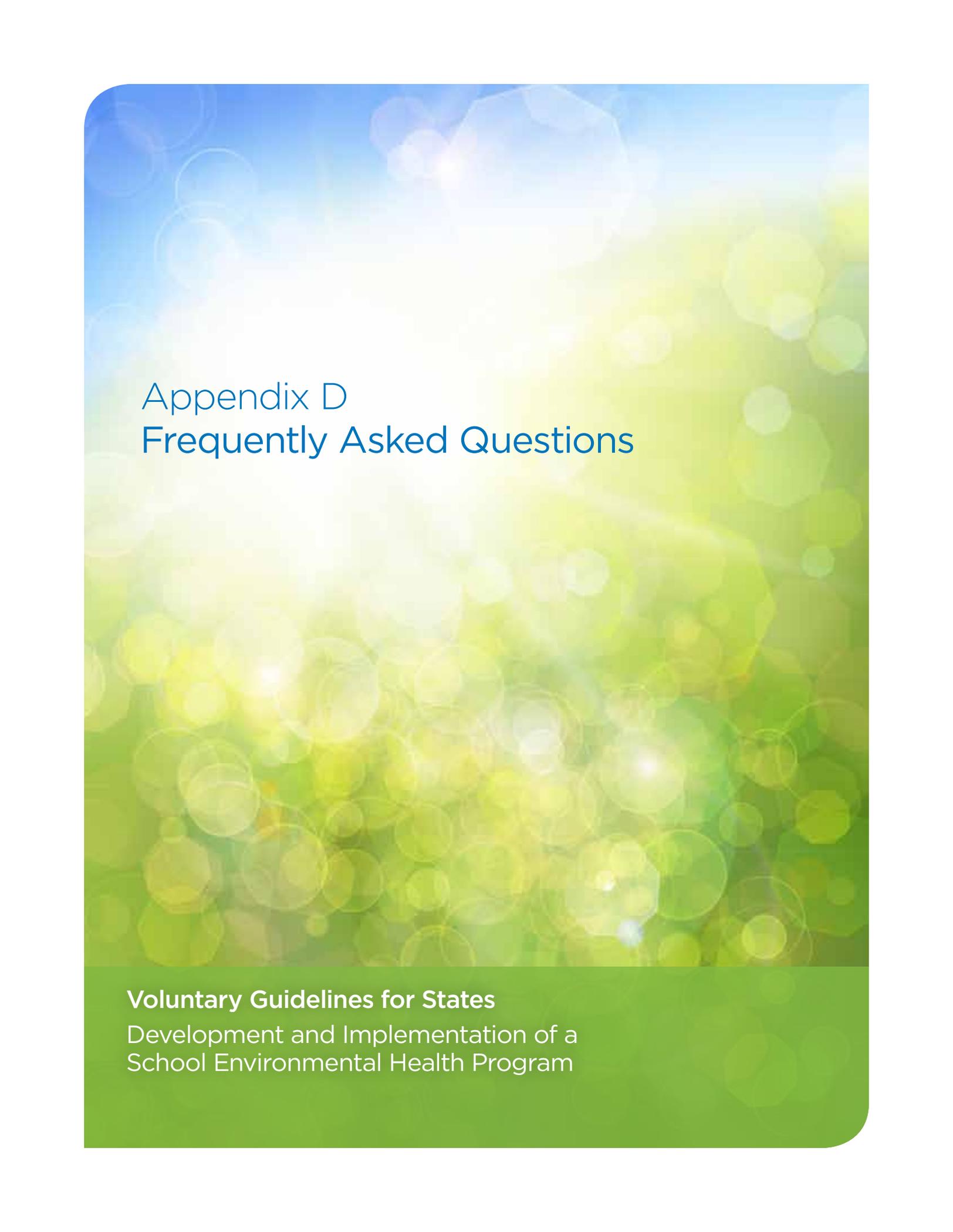
The [Healthy Schools Campaign](#) has developed an [Action and Resource Guide for Healthy Schools](#). While the guide is intended for Illinois schools, the information within can help schools in other states address environmental health issues.

Kats, G. (2006). *Greening America's schools: Costs and benefits*. A Capital E Report <http://www.usgbc.org/ShowFile.aspx?DocumentID=2908>.

National Research Council. (2011). *Climate change, the indoor environment, and health*. Washington, DC: The National Academies Press. 286 pages.

National Research Council. (2006). *Green schools: Attributes for health and learning*. Washington, DC: The National Academies Press. 192 pages.

Frumkin, H., Geller, R.J., Rubin, I.L., & Nodvin, J.T. (Eds). (2006). *Safe and Healthy School Environments*. New York: Oxford University Press. 480 pages.



Appendix D  
Frequently Asked Questions

**Voluntary Guidelines for States**

Development and Implementation of a  
School Environmental Health Program

# Frequently Asked Questions

## Why is the U.S. Environmental Protection Agency (EPA) developing school environmental health program guidelines?

The [Energy Independence and Security Act of 2007](#), signed into law in December 2007, amended the Toxic Substances Control Act, 15 U.S.C. 2601 et seq., by adding a requirement for EPA, in consultation with relevant federal agencies, to develop voluntary guidelines to help states establish and implement environmental health programs in K-12 schools.

Protecting children's health and advancing environmental justice are critically important goals for EPA, as reflected in EPA's strategic plan.<sup>1</sup> A child's developing organ systems are often more sensitive to environmental stressors, and children are frequently more heavily exposed to toxic substances in the environment than adults.<sup>2</sup> Children in minority, low-income, and other underserved populations, as well as children with disabilities, might experience higher exposures to multiple environmental contaminants where they live, learn, and play and could be placed at a disproportionate risk for associated health effects.<sup>3</sup>

## What is the difference between these guidelines and the School Siting Guidelines?

The School Siting Guidelines present recommendations for evaluating the environmental and public health risks and benefits of potential school locations that might be considered during the school siting process. The School Siting Guidelines take into account:

1. The special vulnerabilities of children to hazardous substances or pollution exposure in any case where the potential for contamination at a potential school site exists,
2. The modes of transportation available to students and staff,
3. The efficient use of energy, and
4. The potential use of a school at the site as an emergency shelter.

The Voluntary Guidelines for States: Development and Implementation of a School Environmental Health Program are intended to assist states in establishing and implementing school environmental health programs. These guidelines contain a [model K-12 school environmental health program](#) that takes into account, with respect to school facilities:

- Indoor air quality problems resulting from inadequate ventilation; mold and other allergens; chemicals and pesticides commonly found in schools; contaminants such as radon and diesel exhaust that could enter schools from outside; and specific hazards like elemental mercury, lead paint, and polychlorinated biphenyls;
- Drinking water issues;
- Safety hazards related to improperly stored or managed chemicals;
- Natural day lighting;
- Acoustics; and

- Other issues relating to the health, comfort, productivity, and performance of building occupants.

Both guidelines are voluntary and are intended as resources for states, communities, school districts, schools, and school stakeholders in their efforts to improve the environmental health and conditions of school facilities and to protect the health of children and school staff.

### What do the guidelines cover?

These guidelines recommend six steps that states can take to build or enhance a sustainable school environmental health program and provide extensive resources for states to share with schools and school districts to promote healthy learning environments for children and staff. The guidelines:

- Provide states with guidance for developing and implementing effective policies for school environmental health programs;
- Summarize the cost savings and health benefits associated with adopting a school environmental health program; and
- Provide links to numerous resources to help states establish, implement, and sustain comprehensive state environmental health programs for schools.

### Do the guidelines establish benchmarks to assess the progress of schools toward adopting environmental health programs?

No, the guidelines outline general actions that states can take to implement and sustain a state environmental health program for schools. Every state is unique and will encounter different environmental

health issues, types and levels of resources, and decision-making structures. Specific benchmarks will vary for each state based on the agencies involved, available resources, and existing policies.

### Why are issues such as near-roadway pollution, traffic flow on school grounds, vapor intrusion, nutrition and food handling, or chemicals in building structures not covered in the guidelines?

The guidelines focus primarily on the indoor environment and address environmental health impacts with respect to school facilities as outlined by the Energy Independence and Security Act of 2007. Information on steps that schools and school districts can take to address additional children's health risks can be found on EPA's [Healthy School Environments](#) website.

### How can the guidelines help schools and school districts that have already adopted EPA's Indoor Air Quality (IAQ) Tools for School Program or a Coordinated School Health strategy?

These guidelines build on the foundation established by well-documented strategies and existing federal programs, such as EPA's IAQ Tools for Schools program and the Centers for Disease Control and Prevention Coordinated School Health strategy, and provide examples of best practices from existing state environmental health programs for schools. Schools and school districts already implementing the IAQ Tools for Schools program or a Coordinated School Health strategy can use these guidelines to build on this foundation to expand their current environmental health activities.

### **How do the guidelines relate to other federal programs like the U.S. Department of Education Green Ribbon Schools recognition award?**

EPA developed the guidelines in consultation with multiple federal departments and agencies including the Department of Education, the Centers for Disease Control and Prevention, the Agency for Toxic Substances and Disease Registry, the Department of Agriculture, the Department of Defense, the Bureau of Indian Education, and the White House Council on Environmental Quality.

The activities in these guidelines are consistent with the goals outlined in the resource efficiency, healthy school environment, and environmental curriculum pillars of the U.S. Department of Education Green Ribbon Schools recognition award.

### **EPA stresses life stages as related to environmental health risks. Why don't the guidelines differentiate between exposures to kindergarten students vs. high school students?**

Although environmental exposures and health risks can vary among children at different life stages, all children deserve a healthy environment in which to learn and play. By following the recommendations in the guidelines, states can help provide a safe and healthy school environment for all children.

### **Do the guidelines apply to preschool facilities, day care centers, and other child care facilities/learning centers?**

The guidelines are primarily intended to be used as a resource for states in establishing

environmental health programs for schools. The practices recommended in the guidelines can be applied, with appropriate adaptation, to a wide range of school-related institutions, including child care and early learning centers. EPA believes the recommendations in the guidelines represent a set of best practices for a wide range of settings where children spend time.

### **Are these guidelines relevant or applicable to schools owned or operated by federal agencies?**

**For example, do the voluntary guidelines have relevance or applicability to schools for children in Indian Country owned or operated by the U.S. Department of Interior's Bureau of Indian Affairs/Bureau of Indian Education or stateside schools owned or operated by the U.S. Department of Defense for children of military personnel?**

Yes. The guidelines provide relevant recommendations for managing and operating federally owned or operated schools in an environmentally healthy manner.

### **Will EPA offer any funding for states to implement the guidelines?**

In 2012, EPA made available to states a limited funding opportunity to support implementation of healthy schools programs as outlined in the guidelines. Although future funding opportunities are uncertain, these guidelines demonstrate how every state can take steps to improve the school environment, and ensure that children and staff have healthy places to learn, work, and play.

## Endnotes

1. U.S. Environmental Protection Agency. (2010). *EPA strategic plan*. Retrieved 2012, from U.S. Environmental Protection Agency: [www.epa.gov/planandbudget/strategicplan.html](http://www.epa.gov/planandbudget/strategicplan.html).
2. American Academy of Pediatrics Council on Environmental Health. (2003). Developmental toxicity: Special considerations based on age and developmental state. In Etzel, R., & S. Balk (Eds.), *Pediatric Environmental Health* (Second ed., pp. 9–36). Elk Grove Village, IL: American Academy of Pediatrics Council on Environmental Health.
3. U.S. Environmental Protection Agency. (2003). *America's children and the environment: Measures of contaminants, body burdens, and illnesses*. U.S. Environmental Protection Agency. EPA 240-R-03-001. February. [http://yosemite.epa.gov/ochp/ochpweb.nsf/content/ACEReport3\\_19final.htm/\\$File/ACEReport2\\_21final.pdf](http://yosemite.epa.gov/ochp/ochpweb.nsf/content/ACEReport3_19final.htm/$File/ACEReport2_21final.pdf).



Office of Children's Health Protection (1107A)  
EPA-100-K-12-007  
[www.epa.gov/schools](http://www.epa.gov/schools)  
October 2012

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