Healthy School Environment Investigation

KACEE - Kansas Association for Conservation and Environmental Education

Kansas Green Schools Program

2610 Claflin Rd
785-539-7943
# Table of Contents

Healthy School Environment Investigation

- **Part 1. Introduction** - KACEE and the Kansas Green Schools Program ........................................ Pg. 3
- **Part 2. Leadership Resources** - Background Information ............................................................... Pg. 4-10
- **Part 3. Healthy School Environment Investigation Materials**
  - Directions for Green Team Leaders and Getting Ready to Begin the Investigation ....................... Pg. 11-13
  - About the KGS Healthy School Investigation, Green Team Sign Up, ........................................ Pg. 14-17
- **Part 4. Transportation Investigation** .......................................................... Pg. 17-21
- **Part 5. Air Quality Investigation (Classroom and School-Wide Surveys)** .................................... Pg. 21-29
- **Part 6. Cleaning and Volatile Organic Compounds Investigation** ........................................... Pg. 30-32
- **Part 7. Chemical Management Investigation** ......................................................................... Pg. 33
- **Part 8. Mercury Management Investigation** ........................................................................ Pg. 34
- **Part 9. Curriculum and Community** ................................................................................ Pg. 35-37
- **Part 10. Action Plan/ Healthy School Environment Action Plan Template** ............................... Pg. 37-41
  - Home Connections ...................................................................................................................... Pg. 42
- **Part 11. Resources** ............................................................................................................... Pg. 43-44
  - Vehicle Information Fact Sheet ................................................................................................. Pg. 45-46
  - Green Cleaning Fact Sheet ....................................................................................................... Pg. 46-47
  - Volatile Organic Compounds Fact Sheet ................................................................................ Pg. 48
  - Tools and Instruments for Investigation Fact Sheet ................................................................Pg. 49-50
- **Part 12. Curriculum Connections** .......................................................................................... Pg. 51-53

---

This investigation is modified from PLT’s Green Schools! Program and NWF’s Eco Schools program.
Part 1: Introduction

- KACEE has been promoting and providing conservation and environmental education for all Kansans since 1969.
- KACEE supports community education, outreach and engagement programs statewide to advance the mission of our natural resource agency, higher education, and non-formal education partners.
- KACEE’s environmental education curricula help teachers improve student achievement, engagement in STEM, critical thinking, problem solving, and 21st century job skills.
- KACEE’s professional development programs give educators the confidence to take students outdoors to learn with hands-on activities that are fun and meaningful for students.
- Environmental Education connects kids to nature, supports healthier, active lifestyles, and encourages students to take action to improve their school and environment.
- KACEE encourages and recognizes outstanding achievement through Excellence in Conservation and Environmental Education Awards and Kansas Green Schools Recognition programs.
- Kansas is the only state to have a unique, collaborative partnership with KACEE, Project Learning Tree and the National Wildlife Federation to coordinate Green School certification and recognition between state and national programs.
- Since 1998, the KS Green Schools Program has connected students to their community and the world, while growing problem-solving and leadership skills through service learning projects.
- KS Green Schools investigations engage students in exploring their school's energy, water, school grounds, waste management and creating a greener and healthier learning environment.
- The KS Green Schools Network supports teachers in creating greener and healthier schools through training, networking, grant funding, curriculum resources, and more!
- The KS Green Schools program celebrates and recognizes schools across the state for their green achievements through the KS Green Schools recognition program.
- The KS Green Schools Network connects and inspires teachers in over 500 Kansas Green Schools through an annual Green Schools Conference, Online Forum, Green Schools Updates, Professional Development Workshops, Facebook, and more!

Fan us on Facebook at www.facebook.com/groups/kansasgreenschools

Here you can connect with KACEE and to hundreds of Kansas Educators!
Part 2: Leadership Resources

Healthy Schools Environment Investigation

Healthy School Environment Investigation is designed to support and encourage schools in their quest for a healthy, safe, and environmentally friendly learning environment. As students conduct this Environmental Quality Investigation, they will learn ways to improve indoor air quality and to reduce allergy and asthma triggers.

Students will also learn that emissions from vehicles near the school can enter it through air intake vents and open windows. Those emissions can affect indoor air quality and student health.

Students will learn that biking and walking to school may be good choices for those who live within a reasonable distance to school and can travel using safe routes. Biking and walking to school promote a healthy and active lifestyle for students.

The National Center for Safe Routes to School provides resources and activities that help schools identify ways to improve the safety and ease of walking and biking to school, as well as ways to reduce traffic and air pollution in the vicinity of schools. As a result, such programs help make bicycling and walking to school a safer transportation choice. See the “Resources” section in Part 11 of this document, or visit Safe Routes to School for more information.

The results of the investigation will inform school staff members and students of areas where they can make improvements. Students will generate ideas for action projects, such as the following:

- Promoting a “no idling” policy for buses and cars near their school, especially near school air intake vents.
- Encouraging students and staff members to use school buses, mass transportation, or carpooling.
- Sponsoring a walk- or bike-to-school day.
- Working with school administrators to phase out mercury in the school, including liquid mercury and mercury in equipment such as thermometers.
- Ensuring that ventilation and humidity levels are appropriate to prevent the growth of molds and mildew.
- Working with school administrators to encourage the use of “green” cleaning products so people avoid exposure to toxic chemicals and fumes.
- Reducing indoor air pollutants that can trigger allergies, headaches, and asthma.
- Educating others about practices that promote healthy indoor environments.
Why Should Students Study their School Environment?

Most people know that outdoor pollution can damage their health, but many do not know that indoor air pollution can have harmful effects. It may surprise you that many schools harbor pollutants that can affect the health of students and those working in the school. For example, some indoor air pollutants, such as carbon monoxide, molds, or excessive fumes from cleaning products, can trigger asthma or chronic headaches. According to the Centers for Disease Control and Prevention, asthma is one of the leading causes of school absenteeism. Many studies have shown that absenteeism and illness affect a student’s overall ability to perform. In addition, children are more vulnerable to indoor air pollution than adults are because of their smaller body size and developing lung capacity. (epa.gov)

Types of Indoor Air Pollutants - Indoor air pollutants come from a variety of sources. They can originate in the school or be drawn inside through air intake vents, doors, and windows. Fortunately, most indoor air pollution issues can be resolved with simple, inexpensive measures. A chart with some common indoor air pollutants, their sources, and their possible health effects follows:

### Common Indoor Air Pollutants

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Possible Sources</th>
<th>Possible Health Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon monoxide</td>
<td>Engines, heating equipment, cook tops, ovens, tobacco smoke</td>
<td>Headaches, drowsiness, dizziness, nausea (high levels can cause death)</td>
</tr>
<tr>
<td>Volatile organic compounds (VOC’s)</td>
<td>Gasses emitted from paints, adhesives, cleaning supplies, pesticides; also from new carpets, furnishings, ceiling tiles</td>
<td>Eye, nose, and throat irritation; headaches; confusion; loss of coordination; cancer</td>
</tr>
<tr>
<td>Biological contaminants such as molds, mildews, mites, bacteria, and viruses</td>
<td>Dust, wet moist surfaces, humid air, infected humans or animals</td>
<td>Asthma; allergies; headaches; colds and flu; eye, nose, and throat irritation</td>
</tr>
<tr>
<td>Radon gas</td>
<td>Earth and rock under buildings, some earth-derived building materials</td>
<td>No immediate symptoms, but can cause lung cancer</td>
</tr>
<tr>
<td>Mercury vapor</td>
<td>Mercury spills from science labs or from broken mercury-containing thermometers, thermostats, or light bulbs</td>
<td>Exposure to high levels of mercury can harm the brain, heart, kidneys, lungs, and immune system of adults and children</td>
</tr>
</tbody>
</table>

Source: www.epa.gov

### Students as Scientists

This investigation is modified from PLT’s Green Schools! Program and NWF’s Eco Schools program.
Throughout the investigation, students will have many opportunities to make observations and record results. Students will collect current baseline data about the air quality, the presence of certain hazardous materials in the building, the cleaning supplies and procedures, and more. Depending on availability, students will have the opportunity to use scientific equipment, such as carbon monoxide and relative humidity monitors, to take measurements. The use of those tools will make the investigation more meaningful to the students.

**Air Quality Monitoring Equipment**

Indoor air quality monitoring equipment may be available from your state agency that is responsible for environmental quality in buildings. You may be able to borrow this equipment, or the agency may send a professional to your school to assist with air quality assessments. Indoor air quality monitors are also available for purchase online. Some monitors have multiple functions. In this investigation, students will assess carbon dioxide (CO2) levels, relative humidity, and air temperature ranges of various rooms throughout the school.

**Room Temperature, Relative Humidity, and CO2 Levels**

How comfortable a room feels to those in it is a function of the room’s air temperature, relative humidity, and CO2 level. CO2 is released every time we exhale. It is also released by combustion of fuels. To keep the level of CO2 in a building within an acceptable range, outside air must be mixed with air that is recirculated through the heating, cooling, and air conditioning (HVAC) system. CO2 levels are used as an indicator of proper ventilation. High levels of CO2 in a room may be from blocked or clogged fresh air return vents and filters. Proper maintenance of a school’s HVAC system is critical in maintaining good indoor air quality. Room temperature, relative humidity, and CO2 levels affect a person’s comfort, alertness, and ability to think. People in a room with high levels of CO2 often report feeling drowsy and lethargic.

**Correlations to Academic Standards**

The Kansas Green School Investigations are designed to support your efforts in the classroom with many national education standards. To keep up to date with the correlations, visit [http://www.plt.org/correlations](http://www.plt.org/correlations).
Career and Technical Education for Kansas Kids

Tying Kansas’s kids to real world applications is a great way to engage your students in the investigations. We encourage you to introduce your students to real world professionals throughout the investigations to increase the direct learning opportunities and to increase the depth of experiences. Here are a few of the fields that students may discover throughout the investigations:

- Air quality specialist
- Environmental health and safety analyst
- Environmental health and safety technician
- Environmental law and policy specialist
- Environmental scientist
- Hazardous materials removal worker
- HVAC technician
- Indoor environmental quality specialist
- Manufacturer of indoor environmental quality equipment
- Microbiologist
- Pollution control designer or engineer
- Pollution control inspector or technician

STEM Education and PLT’s Environmental Quality Investigation

Careers in the field of environmental quality often require a background in science, technology, engineering, art and math (STEAM). As students conduct this investigation, they will see real-world applications of these fields of study. A few of the skills that can be taught through this investigation include classifying, estimating, measuring, collecting data, analyzing data, charting, comparing, and reporting.

Service Learning and Scoring Improvements

Students can use the results of this investigation to brainstorm, design, and carry out a service-learning project to improve the overall health of your school, both inside and out. Studies have shown that participation in service learning positively affects academic achievement. For example, a study found that students who participated in service learning scored 6.7 percent higher in reading achievement and 5.9 percent higher in science achievement than did those students who did not participate in service learning. (Source: www.servicelearning.org/instant_info/fact_sheets/k-12_facts/impacts.)

Numerous studies have shown a connection between improvements in indoor air quality and academic performance of both children and adults. Children in classrooms with higher outdoor air ventilation rates tend to achieve higher scores on standardized tests in math and reading than do children in poorly ventilated classrooms. (Sources: www.epa.gov/iaq/)
This investigation is modified from PLT’s Green Schools! Program and NWF’s Eco Schools program.

Kansas Case Study

Superintendent of Erie School District, Steve Woolf, explains how their schools are improving the indoor and outdoor air quality through their purchasing of products, outdoor parking policies and more as a Kansas Green School of Excellence and U.S. Department of Education Green Ribbon School:

Our green cleaning policy’s goal is to reduce the exposure of building occupants and custodial personnel to potentially hazardous chemical contaminants that adversely impact air quality, occupant well-being, and the environment. The policy also helps the district achieve its goals for energy, water, waste reduction and identifies standards that cleaning products and supplies have to meet.

Students also led an initiative to convince the school board that their schools should be free of tobacco products. They researched policies at other districts and developed a policy of their own that the school board adopted. The policy prohibits the use of tobacco products on district property by any person. This greatly improves the air quality and reduces the risk of second hand smoke. The high school also has a Conservation Reserve Program (CRP) native grass mix that helps improve the air quality directly surrounding the school.

Low-emitting and fuel-efficient vehicles are entitled to park in the parking spaces with the “Low Emission Vehicle Parking” signs. In addition, carpools (an arrangement in which two or more persons share a vehicle for transportation) are entitled to park in the parking spaces with the “Carpool Parking Only” signs. The slogan is “the less you emit, the closer you get” as these spots are closest to the building.

Signage is placed around the school explaining all the efforts the school does to improve the air quality of our district, both indoors and out as well as other “green” efforts such as recycling, water conservation and more.
Why is Connecting Our Kids to Nature and Environmental Education Important?

Here are some statistics about the average child in the United States.

- In 2004, American children spent less than half as much time outdoors as their parents. (Kaiser Family Foundation, 2005).
- Kids are reported to spend 7.5 hours per day on electronic equipment during their free time. (Kaiser Family Foundation, 2010).
- A longitudinal study found that children under 13 living in the United States spend on average only about half an hour of unstructured time outdoors each week (Hofferth & Sadberg, 2001).

In 2005, Richard Louv coined the term, “Nature Deficit Disorder” in his book, “Last Child in the Woods.” This term was used to define the potential impacts on children of spending less time outdoors.

Louv states, “Nature-deficit disorder is not an official diagnosis but a way of viewing the problem, and describes the human costs of alienation from nature, among them: diminished use of the senses, attention difficulties, and higher rates of physical and emotional illnesses. The disorder can be detected in individuals, families, and communities” (Louv, 2005).

The reduced contact children are having with nature is leading to a rise in many emotional, mental and physical health risks. Some examples in his book are a rise in childhood ADHD, correlation with rises in childhood obesity and negative impacts on cognitive and conceptual development.

How Does Nature and Environmental Education Help Our Students?

Numerous studies have shown that environmental education has many benefits to children.

- **Science Scores** - Numerous studies have shown that environmental education boosts science scores.
- **Physical Health** - Physical activity is shown to improve children’s health, and a growing body of evidence suggests that exposure to natural environments can improve attention & decrease stress in children. (McCurdy et. Al, 2010)
- **Increased Focus/Improved Cognition** - Wells observed that proximity to nature, access to views of nature, and daily exposure to natural settings increases the ability of children to focus and improves cognitive abilities. (Wells, 2000)
• **Behavioral Management** - Taylor and her colleagues found that children with attention-deficit disorder (ADD) benefited from more exposure to nature – the greener a child’s everyday environment, the **more manageable are the symptoms of ADD.** (Taylor, 2001)

• **Emotional Health** - Taylor also observed that access to green spaces for learning and play, and even having views of green settings, **enhances peace, self-control, and self-discipline** among inner-city youth, especially among girls.

• **Group Cohesion/Increased Creativity** - At the school environment level Bell and Dyment observed that children who experience school grounds or play areas with diverse natural settings are **more physically active, more aware of good nutrition, more creative, and more civil to one another.** (Bell & Dyment, 2006)

• **Community Involvement** - Getting students involved in recycling projects, composting, community swap days and waste education can promote stronger social ties to the community.

**Healthy School Environment Resources**

Many organizations provide educational resources related to Air Quality. See the Resources section in Part 11 for a list of organizations that provide curricula, professional development and more.

**Educational Opportunities for Teachers**

KACEE provides professional learning opportunities for educators across the state with the option to attain one hour of college credit for participating courses. For a current opportunity schedule and learn about the eeCredential Program, visit [https://www.kacee.org/eecredentials](https://www.kacee.org/eecredentials).

**Home Connection**

The results of this investigation will show students how they can make a variety of improvements to their school’s indoor and outdoor air quality. Many of the ideas they generate can also be used at home. See Part 10 for a **Home Connection** chart that can be distributed or made available on school websites for families to download and use.
Directions for Green Team Leaders

There are five areas you might want to investigate as a part of becoming a Kansas Green School of Excellence. These areas include:

1) **Energy** - This investigation will help your team identify current energy management practices and will help in thinking of ways to modify these practices to make your school greener and healthier! Your results will inform school staff and students where they can make improvements and also to generate an action plan to reduce school energy use.

2) **Waste and Recycling** - This investigation will help your team identify current waste management practices and will help in thinking of ways to modify these practices to make your school greener and healthier! Your results will inform school staff and students where they can make improvements and also to generate an action plan to reduce school waste.

3) **Water** - This investigation will help your team identify water practices and will help to identify ways in which your school can conserve water! Your results will inform school staff and students where they can make improvements and also to generate an action plan to improve water efficiency, improve water quality and create conservation ideas for students and staff.

4) **Healthy School Environments** - This investigation will help your team identify air quality and transportation management practices and will help in thinking of ways to modify these practices to make your school greener and healthier! Your results will inform school staff and students where they can make improvements and also to generate an action plan to improve school health for students and staff.

5) **The Learning Community** - This investigation will help your team identify improvements for your school grounds, and ideas to help local wildlife, flora and fauna, the school community, and your neighborhood, city, state, country and world. Your results will inform school staff and students where they can make improvements and to also generate an action plan.
Getting Ready to Begin the Investigation

Step 1. Identify Leaders- Identify one or more Green Team Leaders to be in charge of the Healthy School Environment Investigation.

Step 2. Obtain Permissions- Leaders will want to obtain the necessary permissions from schools administrators before starting the investigation. They should decide how and when the investigation will be conducted to avoid conflicts with school classes and activities.

Step 3. Form Your Green Team- Leaders should decide who will be conducting the investigation. A team approach is recommended. The more diverse the representation on your Green Team, including students and their grade levels, members of the community, etc. the higher the Globe Level you can apply for. Consider including the following representatives:

• Teachers
• Students
• Administrative staff members
• Custodial and maintenance staff members
• Cafeteria staff members
• Parent/Grandparent volunteers
• Resource Professionals in the community

Step 4. Develop Questions for Discussion - Before you begin, gather your KGS Green Team and come up with a list of items and/or questions you have regarding your school’s energy use, waste practices, water quality and usage, school grounds and overall environmental quality. Be sure to add on any items/questions you have that are not included in the KGS’s Investigations.

Step 5. Develop a Schedule and Assign Roles- Discuss how team members are going to conduct the investigation. Will the team always work together, or will the team split into groups and assign sections to each group? Are specific school staff members (custodial, maintenance, administrative) needed during certain parts of the investigation? If so, contact them to schedule a time for that part of the investigation. Develop a schedule for how the team will conduct the investigation.

Step 6. Print the Investigation- Provide a printed copy of the entire investigation to the Green Team members who will be conducting the investigation. Then, they can record information as they walk around the school and complete the investigation. Encourage team members to answer the questions to the best of their ability according to time allotted and documents and materials available to them. The “Teacher Print Out Packet” contains the Individual Classroom
and School Wide Charts to record information on and are available for distribution throughout your school faculty. The Print Out Packet is available on the KGS Website under the Investigation you are completing.

Add any questions that your Green Team discussed that were not covered in the investigation.

**Step 7. Gather Documents and Supplies**- If possible, gather the following documents and supplies before the team begins the Investigation:

- Any written policies related to air quality such as anti-idling, chemical use, cleaning polices, etc.;
- Air quality monitoring tools
- Copies from the “Teacher Print Out Packet” for the investigation that’s on the KGS website under the Healthy School Environment Investigation.

**Step 8. Conduct the Investigation**- Green Team should answer the questions to the best of their ability within the time allotted, and with the information and equipment available.

**Step 9. Develop and Implement an Action Plan**- Based on the information and data collected, the Green Team will prioritize their ideas for action projects and implement one or more of their plans.

**Step 10. Apply for Recognition**- Once your investigation and action plans are complete, you will apply for a Silver, Gold, or Gold Globe Level of Recognition. Rubrics on how each level will be scored along with the applications are available on the KGS website. Visit [http://www.kansasgreenschools.org/apply-recognition](http://www.kansasgreenschools.org/apply-recognition) for more information.

**Step 11. Celebrate Your School’s Success**- Communicate your school’s findings and action plans with the school, school administrators, families, the community and your representatives!

Work together as a team and see the accomplishments you can bring to your school and community!
Healthy School Investigation

Healthy School Environment!

Introduction

Improve the health of your school, both indoors and out!

This investigation will help your team identify air quality and transportation management practices and will help in thinking of ways to modify these practices to make your school greener and healthier! Your results will inform school staff and students where they can make improvements and also to generate an action plan to improve school health for students and staff.

Objectives

- To assess the current transportation practices and impacts on energy use and outdoor air quality at the school.
- To collect, record, map and interpret travel data.
- To assess indoor air quality within the school.
- To assess chemical use within the school and potential impacts on health and indoor air quality.

Objectives:

- Assess how students and staff members get to and from school.
- Draw conclusions about transportation choices, air pollution, and student health.
- Learn about the consequences of unnecessary motor vehicle idling and its effects on indoor air quality (IAQ).
- Collect qualitative and quantitative data about the school’s IAQ.
- Discover how temperature, humidity, and carbon dioxide levels affect IAQ.
- Discover the connections among dust, air particulates, and asthma.
- Learn how a properly functioning heating, ventilation, and air conditioning (HVAC) system can prevent mold and mildew.
- Evaluate current cleaning procedures and products, and their effect on IAQ.
• Assess the sources of mercury in the school, and learn the importance of proper disposal to prevent health risks.
• Assess the sources of volatile organic compounds (VOCs) in the school and how those compounds affect health.
• Discover the connection between environmental quality, learning, and health.
• Develop an understanding of how individual and collective student actions can influence environmental quality.
• Generate plan to improve aspects of the school’s environmental quality and the overall building’s environmental health.
• Implement one or more of the students’ environmental quality improvement strategies.

Time Requirement

The Healthy School Survey will take several 45 minutes sessions to complete, depending on the documentation available, equipment being used, and help from supporting school staff.

Documents and Supplies

• Any written policies your school has related to transportation.
• Copies needed for Classroom/Room Assessments

Healthy School Investigation Overview

1. Transportation in our School
   • Individual Classroom Transportation Assessment
   • School Wide Transportation Survey Assessment
   • School Wide Transportation Assessment

2. Air Quality
   • Indoor Air Quality Information
   • Outdoor Air Quality Information

3. Chemical Management
   • Individual room assessments
   • Whole school assessments

4. Mercury Assessments
   • Whole school

5. Curriculum and Community

6. Action Plan
   • School based recommendations
   • Home Connections
Healthy School Environment Investigation:
In this investigation the school’s green team will review the school’s transportation policies, chemical management and the school’s air quality, both indoors and outdoors. Based on the Green Team’s findings, an action plan will be developed to improve the health of the school.

School Name: _______________ Date: __________

Conducted By: (Please include administrators, teachers, school staff, students, and parents involved in this investigation.)
Name Title/Role
_________________________ ___________________________
_________________________ ___________________________
_________________________ ___________________________
_________________________ ___________________________
_________________________ ___________________________
_________________________ ___________________________
_________________________ ___________________________
_________________________ ___________________________
_________________________ ___________________________
_________________________ ___________________________
_________________________ ___________________________
_________________________ ___________________________
_________________________ ___________________________
_________________________ ___________________________
_________________________ ___________________________
_________________________ ___________________________
_________________________ ___________________________

School Population
Students: ____________
Staff: ________________
Part 4: Transportation Investigation

We use transportation every day. Whether we walk, bike, drive, take a bus or a train, transportation is a very important part of our lives. The way we choose to get from place to place can have a great effect on the environment and our health. Vehicles such as cars, SUVs, trucks, and buses release harmful gases into the environment, which can cause both air pollution and health problems. This section will help you identify the transportation choices students and staff make and help you identify alternatives that have less harmful impacts on health and the environment.

Classroom Transportation Survey

A. Instructions: Print a copy of this survey for each participating classroom. To reduce interruption of instruction, coordinate with teachers to schedule a time to conduct this survey. Try to involve as much of the school population as possible. The results will be used for a school-wide transportation assessment. Turn into __________________by ____________.

| Classroom Number: ____________________ | Grade Level: ____________________________ |
| Teacher’s Name: ______________________ |
| Total # of students in the class: ________ | Total # of staff in the class: ____________ |
| Date of Investigation: ____________________ |
| Total # of Student/Staff who Carpooled in a Personal Vehicle: ____________________________ |

NOTE: A carpool is considered at least 2 students or 2 staff members per car. Carpooling only applies to traveling to school by a personal motor vehicle.

<table>
<thead>
<tr>
<th>School Bus</th>
<th>Personal Vehicle</th>
<th>Bike</th>
<th>Walk</th>
<th>City bus</th>
<th># Carpooled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff (Total #)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students (Total #)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
B. School-Wide Transportation Survey Assessments

**NOTE:** Total all Classroom Transportation Surveys conducted in section A to complete this section.

1. Approximately what percentage of students and staff come to school in a personal vehicle?
   - Students ________%
   - Staff ________%

2. Approximately what percentage of students and staff walk or bike to school?
   - Students ________%
   - Staff ________%

3. Approximately what percentage of students and staff take a city bus to school?
   - Students ________%
   - Staff ________%

4. Approximately what percentage of students and staff carpool, including school buses?
   - (A carpool is considered at least two students or two staff riders per car.)
   - Students ________%
   - Staff ________%
   - School Bus ________%

---

**Did You Know?** According to the EPA, school buses are the safest way for students to get to school and 24 million students ride the bus to school each day here in the U.S. However, pollution from diesel vehicles like school buses has health implications.

Air pollution is not just caused by school buses. Emissions from gasoline powered vehicles driven by staff, students and parents may seem small compared to school buses, but they also contribute to unhealthy air. Plus visitors to the school and delivery trucks all add to air pollution in the school environment. Emissions from school buses, cars and trucks are known as on-road mobile source emissions.

An assessment of the ways students and staff get to school is essential to finding ways to reduce mobile source emissions. Answering the questions, “how do we get to school,” will help your green team identify where to focus your efforts to create a healthier school environment. **Examples might include:** limiting vehicle idling, making it easier to walk or bike to school or creating an online carpool sign up.

5. Does your school have a “Walking School Bus” program?
   - Yes
   - No
6. Approximately how many school buses stop at your school during the day?
   Before School _______
   After School _______
   During School (special programs)__________________

7. Does your county have a rule/law limiting the amount of time a school bus driver may idle the engine while parked?
   Yes
   No

8. Are the school buses owned by the district or private contractor?
   District
   Private contractor

9. If owned by the school district, does your district or school have a policy limiting the amount of time a school bus driver may idle the engine while parked on school property? If owned by a private contractor, does the contractor have a policy limiting the amount of time a school bus driver may idle the engine while parked on school property?
   Yes
   No
   If yes, what is the policy:
   _______________________________________________________________________
   _______________________________________________________________________
   _______________________________________________________________________

10. Has the district or contractor taken any other steps to increase fuel efficiency and/or reduce emissions for the bus fleet?

11. Does your school have a rule/policy limiting the amount of time personal vehicles (for example, family waiting to drop off or pick up students, etc.) may idle the engine while parked?
   Yes
   No
12. Besides buses, what other types of vehicles does your school own or use? What is their average gas mileage?

<table>
<thead>
<tr>
<th>Type of Vehicle</th>
<th>Number</th>
<th>Use</th>
<th>Average Gas Mileage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Car</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mid-sized Car</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economy Car</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid/Electric</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Van</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Truck</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Did You Know? Fuel efficiency is a measure of how much fuel it takes for a vehicle to drive a mile. The U.S. government has a website that explores this concept further and has the average miles per gallon efficiency ratings for most vehicles. Go to: http://www.fueleconomy.gov/

13. If your school has a driver’s education program, does fuel efficiency factor into making decisions about vehicle purchase or use?
   Yes
   No

14. Does your school community participate in a “Safe Routes to School” Partnership or any other programs that promote safety when walking or biking to school?
   Yes
   No

15. Does your school hold bike or walk to school days?
   Yes
   No

16. Does your school provide bicycle racks and a safe place to store bikes for students and staff?
   Yes
   No

17. Which of the following options are available for students and staff to get to and from school?
   Sidewalks
   Bike paths
   Bike lanes
   Public transportation
   School buses
   Other ___________________________
18. Are sidewalks and bike paths safe and accessible for all?
   Yes
   No

19. Does your school sponsor or participate in any programs to encourage carpooling, use of public transportation, or non-vehicular transportation to and from school? If yes, describe the program.
   Carpooling: ________________________________
   Public Transportation: ________________________________
   Non-Vehicular: ________________________________
   Other: ________________________________

C. Action Plan
Based on the information you gathered in this section, what recommendations for improvements would you suggest? Why? What might be the trade-offs for each of the recommendations?

Part 5. Indoor Air Quality Section
While some people know that outdoor air pollution can damage their health, many do not know that indoor air pollution can also have harmful effects. Good indoor air reduces triggers for allergies and asthma. This section will help you identify practices that affect indoor air quality and possible ideas to make improvements.

Safety: Due to the technical nature of maintaining heating, ventilation, and air conditioning systems (HVAC) and the location of these components, school building engineers or maintenance staff should be involved in supplying the information needed for this section.

Air Quality Checklists
The following “walk-through” checklists are adapted from EPA’s Indoor Air Quality Tools for Schools. It will give you a quick overview of conditions that affect the quality of air within your school. Use sight, smell, touch, and hearing while doing your walk-through. You may want to refer to the Indoor Air Quality Tools for Schools Kit for some helpful hints. Visit https://www.epa.gov/iaq-schools for more information.

A. General Indoor Air Quality Information
1. Does your school have an indoor air quality plan?
   Yes
   No
2. Does your school have a regular cleaning schedule and is it followed?
   Yes
   No

3. What cleaning products are used in the school? Are they non-toxic? How are purchasing decisions made? Who does your cleaning supply purchasing? Does the school have a policy about purchase of cleaning products?

4. Have regularly occupied (45 minutes/day or more) spaces at or below ground level have been tested for radon?
   Yes; If Yes, Date of Test and Results: ________________________________
   No

5. Are teachers and staff informed of students’ asthma/allergies?
   Yes
   No

6. In areas with sinks and drains, do the drains have traps?
   Yes
   No

7. Are non-toxic paints chosen when painting the school?
   Yes
   No

8. Is indoor painting done when students and teachers are on break to prevent exposure to paint fumes?
   Yes
   No

According to the EPA, indoor air is three times more polluted than outdoor air. Choosing cleaning products, paints and other chemicals wisely can greatly improve the indoor air quality of your home and school.
B. General Outdoor Air Quality Information
Inspect outdoor areas of school grounds and complete the following checklist.

Air Intakes

1. Are ventilation units on?
   - Yes
   - No
   If yes, is air flowing into the outdoor air intake? _________________________________

2. Are outdoor air intakes free from blockage or obstruction?
   - Yes
   - No

3. Are bird or animal droppings near air intakes?
   - Yes
   - No

4. Are sources of vehicle exhaust accumulation (parking, loading docks, bus loading, etc.) located near or upwind of air intakes?
   - Yes
   - No

5. Does your school routinely spray for pests when your school is out of session?
   - Yes
   - No

6. In the summers, does your school practice a mowing reduction program?
   - Yes
   - No

7. Is your school a Tobacco Free school or campus?
   - Yes
   - No

8. Are garbage dumpsters located near air intakes or windows and doors that are frequently open?
   - Yes
   - No
C. Action Plan
Based on the information you gathered in this section, what recommendations for improvements would you suggest? Why? What might be the trade-offs for each of the recommendations?

Indoor Air Quality (IAQ)
Section B: Temperature, Relative Humidity, and Carbon Dioxide
In this section, you will use scientific equipment to measure the temperature, relative humidity, and carbon dioxide (CO2) levels in various rooms throughout the school. You will also look for things that contribute to the buildup of dust, molds, and mildew, all of which affect indoor air quality. The results will then be tallied. The data gathered will help you determine if changes could be made that would improve indoor air quality at your school.

To reduce interruption of instruction, coordinate with teachers to schedule a time to take measurements in classrooms. Check with the school office staff to schedule a time to take measurements in other rooms, such as the cafeteria, gym, lockers rooms, etc if needed.

NOTE: Be sure to check out the Resources Section (Part 11) on tools and information needed for this section.
Individual Room Indoor Air Quality Measurements

**Directions:** Obtain your air quality testing tools (information of Resources Section- Part 11). Check to make sure the tools are charged and calibrated (if applicable). If possible, take room readings at three different times of the day. Record the time for each reading.

To find the temperature range, take three readings at different points around the room using a standard or infrared thermometer. Note if the temperature is in degrees Fahrenheit or Celsius.

Relative humidity is measured as a percentage of 100; and CO2 units are parts per million, or ppm. Circle any measurements that are outside of the acceptable occupied ranges.

### Individual Room Indoor Air Quality Measurements

<table>
<thead>
<tr>
<th>Date: ____________________________</th>
<th>Room # or Location: ____________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher or Supervisor:________________________</td>
<td>Grade or Use:________________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Time of Day</th>
<th>Temperature Range (F/C)</th>
<th>Relative Humidity (%)</th>
<th>CO2 Level (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading 1 (morning)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading 2 (midday)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading 3 (afternoon)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Temperature:**
Summer (AC): 74-79 Fahrenheit if building is occupied; can be raised to 80 degrees if unoccupied. (23-36 Celsius)
Winter (heat on) 68-75 Fahrenheit if building is occupied; can be lowered to 66 degrees if unoccupied. (20-24 Celsius)

**Relative Humidity:**
Relative humidity should be in the range of 30-60 percent. Humidity levels above 60 percent encourage microbial buildup and are thus a health concern.

**Carbon Dioxide (CO2):**
Indoor CO2 levels should not exceed 1,000 parts per million (ppm).
This investigation is modified from PLT’s Green Schools! Program and NWF’s Eco Schools program.

---

**Schoolwide Indoor Air Quality Measurements Tally Chart**

**Directions:** Tally the results from the “Individual Room Indoor Air Quality Measurements” on the chart below.

<table>
<thead>
<tr>
<th>Time of Day</th>
<th>Temperature Range (F/C)</th>
<th>Relative Humidity (%) *</th>
<th>CO2 Level (ppm) *</th>
<th>Number of rooms outside of acceptable ranges **</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading 1 (morning)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading 2 (midday)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading 3 (afternoon)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
* Indicate the range of values measured for all rooms surveyed at each of the three times.
** Indicate the number of rooms that had measurements that were not within the acceptable occupied ranges for temperature, relative humidity, and CO2.

**Acceptable Occupied Ranges**

**Temperature:**
Summer (AC): 74-79 Fahrenheit if building is occupied; can be raised to 80 degrees if unoccupied. (23-36 Celsius)
Winter (heat on) 68-75 Fahrenheit if building is occupied; can be lowered to 66 degrees if unoccupied. (20-24 Celsius)

**Relative Humidity:**
Relative humidity should be in the range of 30-60 percent. Humidity levels above 60 percent encourage microbial buildup and are thus a health concern.

**Carbon Dioxide (CO2):**
Indoor CO2 levels should not exceed 1,000 parts per million (ppm).
School-wide Questions on Indoor Air Quality Measurements

1. Did the time of day make a difference in CO2 levels, temperature, or humidity?
   - Yes
   - No

   If yes, which varied the most and why do you think this happened?

2. Did the location of the room make a difference in CO2 levels, temperature, or humidity?
   - Yes
   - No

   If yes, note any observations:

3. Are room temperatures within acceptable occupied ranges for the season?
   - Yes
   - No

   Note any areas with temperatures that are not within acceptable ranges:

4. Is the relative humidity in the school within acceptable ranges (30-60%)?
   - Yes
   - No

   Note any areas with relative humidity ranges that are not within acceptable ranges:

5. Did CO2 levels remain below 1,000 ppm throughout the building?
   - Yes
   - No

   Note any areas with CO2 levels that are not within acceptable ranges:

6. Brainstorm, and then record a list of ways that the Indoor Air Quality of the school could be improved on the basis of temperature, relative humidity, and carbon dioxide levels.
Classroom Air Quality Survey

Instructions: Print a copy of this survey for each classroom that will be assessed. Try to involve as many rooms in the school as possible. Record the results for each room on the chart. The results will be compiled on the “School-wide Air Quality Survey.”

Turn into____________________by ________.

| Classroom Number or Location: |
| Teacher’s Name and Grade: |
| Date of Investigation: |
| Are there live plants in the room? | Yes | Number of Plants: |
| Can the windows be opened and closed? (NOTE: This can assist with adequate air exchange) | Yes | Comments: |
| Do you think there is adequate air exchange in this room? | Yes | Comments: |
| Are there air fresheners of any type in the room? | Yes | Comments: |
| Are there any signs of ongoing water damage in the classroom? | Yes - Where? ____________________________ | |
| Are there signs of mold or mildew in the classroom? | Yes - Where? ____________________________ | |
| Are air supply and exhaust vents clear? (Nothing blocking air movement) Are they generally free from odors? | Yes | Explain: |
| Are the air supply and exhaust vent areas clean and relatively dust free? | Yes | Explain: |
| Is there an odor from cleaning products, paint, or new furnishings (carpet, furniture)? | Yes | Explain: |
| If animals are kept in the classroom: |
| a. Are the cages cleaned regularly? ___ Yes ___ No |
| b. Is animal food stored in tightly sealed containers? ___ Yes ___ No |

Recommendations: Given this information, what recommendations, changes or improvements should be made to improve the overall air quality of this space?
### School-Wide Air Quality Survey

Review all non-classroom space locations in the school to assess air quality. Review Classroom Surveys along with School-Wide Surveys to notice any trends within the school.

<table>
<thead>
<tr>
<th>Area of School Being Surveyed:</th>
<th>Date of Investigation:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>Comments:</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are there live plants in the room?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can the windows be opened and closed? (NOTE: This can assist with adequate air exchange)</td>
<td>Yes</td>
<td>Comments:</td>
<td>No</td>
</tr>
<tr>
<td>Do you think there is adequate air exchange in this room?</td>
<td>Yes</td>
<td>Comments:</td>
<td>No</td>
</tr>
<tr>
<td>Are there air fresheners of any type in the room?</td>
<td>Yes</td>
<td>Comments:</td>
<td>No</td>
</tr>
<tr>
<td>Are there any signs of ongoing water damage in the classroom?</td>
<td>Yes- Where? ________________________</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Are there signs of mold or mildew in the classroom?</td>
<td>Yes- Where? ________________________</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Are air supply and exhaust vents clear? (nothing blocking air movement) Are they generally free from odors?</td>
<td>Yes</td>
<td>Explain:</td>
<td>No</td>
</tr>
<tr>
<td>Are the air supply and exhaust vent areas clean and relatively dust free?</td>
<td>Yes</td>
<td>Explain:</td>
<td>No</td>
</tr>
<tr>
<td>Is there an odor from cleaning products, paint, or new furnishings (carpet, furniture)?</td>
<td>Yes</td>
<td>Explain:</td>
<td>No</td>
</tr>
</tbody>
</table>

If animals are kept in the classroom:
- c. Are the cages cleaned regularly? ___ Yes ___ No
- d. Is animal food stored in tightly sealed containers? ___ Yes ___ No

Recommendations: Given this information, what recommendations, changes or improvements should be made to improve the overall air quality of this space?
Part 6. Cleaning and Volatile Organic Compounds Investigation

In this section, the team will assess the cleaning practices and presence of volatile organic compounds (VOCs) in the school building.

VOCs are chemicals that evaporate at room temperature. VOCs are emitted by a wide array of products used in schools including cleaning supplies, paints, lacquers, varnishes, air fresheners, pesticides, building materials, and furnishings. VOCs are released from products into the air both during use and while stored. VOCs can cause eye, nose, and throat irritation; headaches; nausea; and additional health problems with high levels of exposure.

STEAM IDEA: Recipes for making “green” cleaners are available online. Students can make their own cleaners and then test them against commercial cleaners and determine which works best. Students could also test numerous recipes or create and test their own.
Schoolwide Cleaning and Volatile Organic Compounds

Directions: Interview the custodial or maintenance supervisor to help you complete this chart. For each type of cleaning performed, note how frequently it occurs (for example, two or more times a day, daily, weekly, monthly, or once a year, and so forth). A sample is provided.

<table>
<thead>
<tr>
<th>Type of Room</th>
<th>Floors (Indicate “C” if carpeted; “H” if hard surface)</th>
<th>High-contact hard surfaces (desks, chairs, tables, etc.)</th>
<th>Ceilings, walls, air vents</th>
<th>List cleaning products used daily, weekly or monthly</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample: Classrooms</td>
<td>H- cleaned daily</td>
<td>Cleaned once a week</td>
<td>Cleaned twice a year</td>
<td>Floor wax, window cleaner, disinfecting cleaner</td>
<td>Window cleaner used in classrooms is nontoxic.</td>
</tr>
<tr>
<td>Classrooms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructional rooms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gymnasium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Locker rooms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cafeteria</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kitchen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hallways</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auditorium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bathrooms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
C. Cleaning and Volatile Organic Compounds (VOCs)

1. According to observations of the Green Team, is the cleaning frequency for the various types of rooms adequate?
   
   Yes
   No
   
   If no, list the areas where the cleaning is not adequate: ____________________________

2. Who is responsible for purchasing cleaning supplies? ____________________________

3. According to observations of the Green Team, is the cleaning frequency for the various types of rooms adequate?

   Yes
   No

4. Are green cleaning products purchased and used?

   Yes
   No

5. Are maintenance and janitorial staff members trained in ‘green’ cleaning techniques? (For example, when possible, is the school cleaned when it is unoccupied or using cleaning products that are nontoxic and have low VOCs? See the “Fact Sheet: Green Cleaning” and the “Fact Sheet: VOCs” in Part IV of this document for more information.)

6. Are maintenance and janitorial staff members trained in ‘green’ cleaning techniques? (For example, when possible, is the school cleaned when it is unoccupied or using cleaning products that are nontoxic and have low VOCs? See the “Fact Sheet: Green Cleaning” and the “Fact Sheet: VOCs” in Part 11 of this document for more information.)

   Yes
   No

7. Is indoor painting and installation of new materials, such as carpets and ceiling tiles, done when students and teachers are on break to prevent exposure to paint fumes?

   Yes
   No

8. Brainstorm and then record ideas for improving the cleaning practices and use of cleaning products at your school.

This investigation is modified from PLT’s Green Schools! Program and NWF’s Eco Schools program.
Part 7. Chemical Management Investigation

Chemicals, although useful and often necessary, can potentially be dangerous to you and the environment. This is especially true if the chemicals are not handled or stored properly. Chemicals are found in many locations throughout a school, including labs, custodial closets, and the health clinic. The key to chemical safety is proper handling, storage, and disposal. This section will help identify various chemicals within the school and how they are being handled. It will start you thinking about how to properly handle chemicals, how to reduce the amount of chemicals stored in your school, and ways to lower the risk of an accident or spill.

Safety: Due to the hazardous properties of various chemicals, teachers and other appropriate staff should complete the following questions with the students for each room that contains chemicals. (You should consider compressed gas a chemical.)

Chemical Management Survey

Print a copy of this survey for each area housing chemicals. Turn into ______________ by _____.

<table>
<thead>
<tr>
<th>Room Name, Number &amp; Use of the Room:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chemical Inventory:</strong></td>
<td></td>
</tr>
</tbody>
</table>
| How often is an inventory of the chemicals conducted? | Once every three months or more frequently  
  Once every year  
  Once every two years  
  Less frequently than once every two years |
| Are Material Safety Data Sheets (MSDS) available for chemicals used in this room? (Excluding retail chemicals which can be purchased for household use). | Yes  
  No |
| Where are the MSDS Sheets located? | In each room where chemicals are being used  
  In the office  
  In the chemical storage room/closet  
  Other |
| Does your school keep an updated inventory list of the chemicals stored in each storage room/closet? | Yes  
  No |
| **Disposal:** Are the hazardous chemicals disposed of as outlined by their MSDS sheet? | Yes  
  No |
| **Purchasing:** Are chemicals or chemical based substances purchased in bulk or in small quantities on an as needed basis? | All or most chemicals are purchased in bulk  
  Some chemicals are purchased in bulk  
  All or most chemicals are purchased in small quantities as needed |
| Are less hazardous or environmentally friendly chemical substitutions considered when purchasing chemicals? | Yes  
  No |
| What training is the teacher or staff person in charge of the space provided? |  |
Part 8. Mercury Investigation

Mercury is found in very small amounts naturally in the environment. It is, however, a substance that can have some very harmful effects. Mercury can be harmful if it is spilled or disposed of improperly. Replacing mercury-containing items such as thermometers, barometers, and thermostats with mercury-free alternatives can reduce the chances of being exposed to mercury. This section will help you identify mercury-containing items in the school. It will also help you become familiar with the school’s mercury use and storage practices. If mercury is located in your school, students can work towards becoming a “mercury free school”.

Safety: Students should not handle mercury products while completing this section of the Green Schools Investigation. A teacher, principal, or maintenance person should accompany students on this section of the investigation. If you find any mercury containing equipment or devices, consider labeling them so they are properly handled.

1. How does your school handle “burned out” fluorescent bulbs? (Fluorescent bulbs contain small amounts of mercury. For information on proper disposal visit http://www.epa.gov/epawaste/hazard/wastetypes/universal/lamps/index.htm )
   - Recycled
   - Disposed of as hazardous waste
   - Thrown in the trash
   - Other ______________________

2. If recycled, what does your recycler do with these fluorescent bulbs?

3. Does your school have a written procedure for handling mercury spills?
   - Yes _____ No _____
   - If yes, where is it kept: ______________________

C. Action Plan

Based on the information you gathered in this section, what recommendations for improvements would you suggest? Why? What might be the trade-offs for each of the recommendations?

To learn more about the restrictions of mercury usage in schools, visit: https://www.epa.gov/mercury
Part 9. Curriculum and Community

I. Curriculum and Community – Transportation
1. Does your school curriculum include transportation-related topics covering health, safety, and environmental impacts of transportation choices as part of the curriculum?
   - Yes
   - No
If yes, which subjects or courses and at what grade levels are they offered?

<table>
<thead>
<tr>
<th>Subject/Course</th>
<th>Grade Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Does your school sponsor or participate in any programs that encourage environmentally sound ways to get to and from school (ie. ride-share, Safe Routes to School Program, bike to school week, bike safety classes, and so forth)?
   - Yes
   - No
If yes, please describe the programs:

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

II. Curriculum and Community – Air Quality
1. Is indoor air quality or information on asthma/allergies included in the curriculum?
   - Yes
   - No
If so at what grades and in what subjects is it included?

<table>
<thead>
<tr>
<th>Subject/Course</th>
<th>Grade Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
III. Curriculum and Community – Cleaning and VOC’s
1. Does your school curriculum include information on VOC’s in the curriculum?
   Yes
   No
If so, in what subject(s) is it included and at which grade levels?

III. Curriculum and Community - Chemical Safety
1. Is chemical safety/handling included in the curriculum?
   Yes
   No
If so, in what subject(s) is it included and at which grade levels?

<table>
<thead>
<tr>
<th>Subject/Course</th>
<th>Grade Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Do all students and staff wear appropriate personal protection equipment when handling chemicals or scientific apparatus?
   Yes
   No

3. Does your community have a chemical collection program to encourage the proper disposal of chemicals?
   Yes
   No
If yes, are schools allowed to participate?______________________________________________________________

4. Where are your community’s local household hazardous waste disposal sites?
_______________________________________________________________________________________________
_______________________________________________________________________________________________
_______________________________________________________________________________________________
_______________________________________________________________________________________________
IV. Curriculum and Community – Mercury

1. Does your school teach the environmental and health effects of mercury pollution as part of the curriculum?
   - Yes
   - No

If yes, in what subject is it included and at which grade levels?

<table>
<thead>
<tr>
<th>Subject/Course</th>
<th>Grade Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Does your community have a mercury collection program to encourage the proper disposal and handling of mercury-containing items?
   - Yes
   - No

3. Does your community have any regulations concerning the sale or disposal/recycling of mercury containing products?
   - Yes
   - No

If yes, how are local citizens being informed about them?
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Part 10: Action Planning

Explore the data you have collected from the classrooms and the school. It may be helpful to combine data into over all totals to help your Green Team analyze your data.

To search for local Household Hazardous Waste Disposal sites, visit: [www.kansasrecycles.org](http://www.kansasrecycles.org) and visit the “Find Recycling Programs.”
Based on the information you found out from this investigation, what recommendations do you have for the school to improve the overall health of your school through transportation, indoor and outdoor air qualities or chemical management?

Calculations:

- What is the total percentage of student’s carpooling: ________________
- What is the total percentage of staff carpooling: ____________________
- What is the total percentage of students and staff walking to school: ________
- What is the total percentage of students and staff biking to school: __________

NOTE: If you only collected data on one day, you may want to repeat your data samples on multiple days to get more accurate results. You may also want to conduct periodic classroom and school wide waste characterization investigations to chart your school’s progress.

What additional information from your investigations of transportation, indoor air quality, chemical management and mercury management did you find that might have implications for your action plan:

To develop your action plan, consider the following questions:

- What are your school’s goals to improve its overall health?
- What are the potential economic benefits of reducing improving your school’s health?
- What are the environmental and/or health benefits of improving the quality of your school’s air quality?
- What are the benefits of implementing anti-idling policies to your school’s health?
- How can you engage the broader school and community in setting goals?
- What are some potential strategies you might use to address those areas where your Green Team would like to make improvements?
- What resources (including funding) will your school need to implement strategies and where might your school obtain these resources?
- How can you engage students, school personnel, parents and community in helping to develop and implement these strategies?

Home Connections:

- How can you encourage students to support your school’s goals at home?
The following template may be helpful to create an action plan for success! Strategies to think through are transportation, Indoor Air Quality, Cleaning and Volatile Organic Compounds, Mercury and Chemical Safety and Education, Training and Community Connections.

<table>
<thead>
<tr>
<th>Healthy School Environment Action Plan</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>School Name:</td>
<td></td>
</tr>
<tr>
<td>School Goal:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Resources Needed</th>
<th>Persons Responsible</th>
<th>Timeline</th>
<th>How will you measure, communicate and celebrate success?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Action Planning Ideas

Carpooling and “No Idle” Zones

• Realize that how we get from point A to point B is a choice. We use transportation every day. Whether we walk, bike, drive, take a bus, or ride a train, transportation is a very important part of our lives. The way we choose to get from place to place can have a great effect on the environment and our health.

• Investigate the use of “no idle” zones at schools and other locations across the state.

• Research the types of alternative fuel vehicles or fueling options that are available in your area.

• Explore the world of alternative fuel and hybrid vehicles.

• Determine if school buses can be converted to compressed natural gas (CNG).

Classroom Learning Environment

• Relative humidity, temperature, and carbon dioxide (CO2) affect personal comfort, alertness, and clear thinking. Unusually high levels of CO2 may indicate blocked or clogged fresh air return vents and filters.

• Evaluate and regulate the temperature range to improve comfort for room occupants.

• Inspect heating, ventilation, and air conditioning (HVAC) filters every month, and replace or clean them as needed, especially during peak heating or cooling months. Changing filters improves efficiency and helps reduce allergens in the air.

• Create a plan to “declutter” a room, a space, or the whole school. Too much clutter affects both the flow of people and the flow of good clean air and can serve as spaces for pests to live. Clutter can also make it hard to keep spaces free of dust, which is a major allergen for some people. Host a “clean your space” event.

• Look for evidence of past or current water stains. Water is usually an indication of mold. Water sources may include roof, window, or pipe leaks; condensation problems; high humidity; recurring spills; and dripping faucets.
Noxious Fumes and Vapors

- Use your nose. Smells can trigger asthma attacks and headaches in many people. Do classrooms or areas of the building “smell”?

- What percentage of rooms use pop-up or plug-in air fresheners? They can be an allergen for some people.

- Research new purchases made in the past 6 months. Are any items known volatile organic chemical (VOC) emitters?

- Conduct a survey of people in the building who have asthma or chronic headaches. How many people are affected? Are there certain building locations or times of the day when symptoms are worse? **Mercury, Chemicals, and Science Labs**

- Work with school administrators to phase out all high-mercury fluorescent lighting. Newer fluorescent bulbs should be EPA nonhazardous certified (TCLP) or look into LED lighting.

- Become familiar with the school’s mercury use and storage practices. If mercury is located in your school, you can work to become a “mercury free school.” For further information on teaching about mercury visit www.epa.gov/hg/schools.htm.

- Help educate students, teachers, and parents about the health hazards and environmental effects of mercury. Promote recycling of mercury and mercury-containing products.

- Create mercury or hazardous materials sticky labels to place on toxic materials located around the school building. Send labels home as part of a community awareness campaign.

**Purchasing and Cleaning Options**

- Examine the concept of “environmentally preferred purchasing.”

- Visit www.cleaningforhealthyschools.org to see what districts in one state are doing about green cleaning supplies and methods and about removing chemical toxins from their school buildings.
# Home Connections

<table>
<thead>
<tr>
<th>Family Name:</th>
<th>Date:</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Has your home been tested for radon?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Do you regularly change the filters on your heating and air conditioning units to improve efficiency and reduce allergens?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Do you use household cleaners that are nontoxic and safe for use around children and pets?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Have you checked your home for mold and mildew?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Do you use fans in the kitchen and bathrooms to prevent moisture buildup that can lead to the growth of mold and mildew?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Are car engines turned off when the car is in the garage or near air intakes? (idling produces dangerous gases such as carbon monoxide.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Have you replaced old thermometers that contain mercury with newer mercury-free thermometers? (Thermometers containing mercury should be properly disposed of to prevent mercury contamination.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. If you have pesticides, are they stored outside?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. If you have pesticides, are they used according to label instructions?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Do you use alternatives to pesticides, such as integrated pest management?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Do you purchase “green” cleaning products? (these have lower VOC’s which improves the overall air quality and health in your home)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How healthy is your home? Indoor pollutants can cause headaches, dizziness, nausea, fatigue, dry or runny eyes, congestion, and sore throats. They can also increase the symptoms of asthma. There are many simple things that you can do to improve the health of your home. The various factors from above impact your indoor air quality.

For more information on reducing indoor air pollution, visit the following U.S. EPA website: [www.epa.gov/iaq/index.html](http://www.epa.gov/iaq/index.html)
Part 11: Resources

General Links

- Contact the Kansas Association for Conservation and Environmental Education (KACEE at www.kacee.org) for local resource contacts.
- Kansas Green Schools for resources and contacts with other schools in the state (www.kansasgreenschools.org)

Healthy School Environment Links

- Safe Routes to School - http://www.saferoutesinfo.org/ The National Center for Safe Routes to School provides resources and activities that help schools identify ways to improve safety and accessibility for walking and biking to school, and ways to reduce traffic and air pollution in the vicinity of schools. As a result, these programs help make bicycling and walking to school safer transportation choices, thus encouraging a healthy and active lifestyle for students.

Indoor Air Quality Tools for Schools Kit –

- This website links to the U.S. EPA Indoor Air Quality Tools for Schools Kit. It provides a wealth of information on how schools can assess and improve indoor air quality. https://www.epa.gov/iaq-schools

Facts and Information

Fluorescent Bulb Recycling and Disposal: (https://www.epa.gov/cfl/recycling-and-disposal-cfls-and-other-bulbs-contain-mercury) This U.S. EPA website provides information on the proper disposal or recycling of fluorescent bulbs, which contain small amounts of mercury.

Mercury Spill Remediation: (https://www.epa.gov/mercury/what-do-if-you-spill-more-mercury-amount-thermometer) This U.S. EPA website provides information on how to clean up mercury spills.


These two U.S. EPA websites provide facts on molds and tips for reducing mold in schools.
Asthma Information: www.epa.gov/iaq/schools/managingasthma.html This is the homepage for Managing Asthma in the School Environment, which is provided by the U.S. EPA.

Indoor Air Pollution: https://www.epa.gov/indoor-air-quality-iaq This U.S. EPA website provides information on how to reduce indoor air pollution.

Books


Frumkin, Howard, I Leslie Rubin, and Robert J. Geller, eds. Safe and Healthy School Environments. New York: Oxford University Press, 2006; ISBN-13: 9780195179477. Different aspects of the school environment are examined, including the physical environment of the school, air quality issues, pest control, cleaning methods, food safety, safe design for playgrounds, crime and violence prevention, and transportation. The last two parts make recommendations for school administrators to maximize the health of their schools.
• One hour of idling burns up to a gallon of fuel. (Fuelmax Fuel Saving Tips)

• An idling engine delivers zero miles to the gallon.

• Drivers who shut off their engines, rather than idling for 30 seconds, benefit from both fuel savings and improved air quality. (Average of recommended times from the U.S. EPA, Natural Resources Canada, and Programs Europe)

• Frequent restarting has little impact on engine components such as battery and starter motor. Wear caused by restarting is estimated to add $10 per year to the cost of driving. This cost is likely recovered several times over in fuel savings. (Natural Resources Canada)

• Excessive idling can be hard on your engine because it isn’t working at peak operating temperature. Fuel doesn’t undergo complete combustion, which leaves spark plugs dirty and contaminates engine oil. (Oregon’s Clean Air Action Day fact sheet)

• Idling isn’t an effective way to warm up your vehicle in cold weather. Modern engines need no more than 30 seconds of idling on winter days before starting to drive. (Natural Resources Canada)

• Idling buses tested had higher concentrations of particulates and carbon than did moving buses. (Environment and Human Health Inc. [EHHI])

• Queued idling buses had the highest levels of particulates and black carbon. Idling buses tend to accumulate diesel exhaust, which may be retained during the ride, depending upon bus ventilation rates. (EHHI)

• A bus idling for 1 hour a day during the school year adds the equivalent of 1,260 miles of wear on the engine. (Oregon Department of Environmental Quality [DEQ])

**Effect on Health**

• Asthma is the third leading cause of hospitalization among children under the age of 15. (American Lung Association)

• Air pollution may account for 5 percent of hospital admissions for heart disease. (National Institute of Environmental Health Sciences [NIEHS])
Children

• Children breathe 50 percent more air per pound than do adults. (U.S. EPA sheet on school bus idling)
• Asthma is the most common chronic illness in children and the cause of most school absences. (American Lung Association)
• For one child, a half-hour ride to school and a half-hour ride home each day amounts to 180 hours per school year and 90 full 24-hour days over 12 years of school. Annually, U.S. children spend 3 billion hours on school buses. (EHHI)

Green Cleaning Fact Sheet

Using green cleaning products and practices can be less harmful to human health and the environment than are some cleaning products and practices used by many schools today. The following are some easy tips that schools can take to start greening their cleaning products and practices.

Green Cleaning Products:

Use cleaning products that have the following:

• Neutral pH levels and no known carcinogens
• Low or no volatile organic compounds (VOCs)
• Energy and water savings benefits

Benefits

• Biodegradability
• Less packaging
• Other positive health and environmental attributes

The chemicals used in some cleaning products can be harmful to human health, as well as to the environment. Human health problems from chemicals found in some cleaning products can cause eye, nose, and throat irritation, as well as headaches. If the cleaning products contain VOCs, adverse health effects can include asthma, upper respiratory irritation, fatigue, nasal congestion, nausea, and dizziness.
Using green cleaning products and practices may avoid those health effects and may do the following:

- Protect students, who may be more vulnerable to chemicals than are adults.
- Protect the health of custodial staff members who have frequent interaction with cleaning chemicals.
- Prevent student and faculty absences.
- Increase the lifespan of facilities.
- Increase cost savings by using fewer products.
- Improve the school environment.

**Build a green cleaning program.** You can make a difference to student health and the environment by developing a green cleaning program. Here are some tips to get a green cleaning program started. Remember, no two programs are alike. Use the tips that make sense for your individual school or school district.

**Involve the right people.** Administrators, teachers, and custodians all have a role in designing and implementing your green cleaning program. Whenever possible, schools should bring in organizations with an interest in safe chemical management and healthy schools, such as chemical and product suppliers, industry leaders, and other community partners.

**Select products with positive environmental attributes.** Encourage suppliers to stock products with positive environmental attributes. Evaluate contracts with suppliers and cleaning services for consistency with your cleaning goals.

**Take a look at your current cleaning practices.** Green cleaning is about more than the products you use. Be sure that employees are properly trained to identify outdated or unneeded chemicals that need to be disposed, know what to do if there is a spill, know how to use products according to label directions, and have the proper equipment. Consider policies that allow for scheduling cleaning at the appropriate time and frequency. When possible, clean when the building is unoccupied. Train employees to use product Materials Safely Data Sheets (MSDSs) and labels for use, storage, and disposal.

**Properly manage and dispose of chemicals.** Oversee and eliminate inappropriate, outdated, unknown, and unneeded chemicals. Regularly monitor your cleaning product supply and usage through good purchasing control and inventory practices.

**Regularly evaluate your green cleaning practices.** Stay on top of the most current policies and practices, and ensure that they are implemented. This approach will help you protect students, staff members, and the environment.

Source: U.S. EPA Schools Chemical Cleanout Campaign. “SC3: Protecting Students and Staff with Green Cleaning.”
Volatile organic compounds (VOCs) are chemicals that evaporate at room temperature. VOCs are emitted by a wide array of products used in schools including paints and lacquers, paint strippers, varnishes, cleaning supplies, air fresheners, pesticides, building materials, and furnishings. VOCs are released from products into schools both during use and while stored.

VOCs cause eye, nose, and throat irritation; headaches; and nausea, and they can damage the liver, kidney, and central nervous system. The following are a few tips that will help ensure safety when handling products that may release VOCs:

- Read and follow all directions and warnings on cleaning products.
- Make sure you have plenty of fresh air and ventilation (e.g., open windows and use extra fans) when painting, remodeling, or using other products that may release VOCs.
- Never mix products, such as cleaners, unless directed to do so on the label.
- Store cleaning products that contain chemicals according to manufacturers’ instructions.
- Buy limited quantities of products containing VOCs that are used only occasionally or seasonally. This approach will reduce the release of vapors during long-term storage. Various testing laboratories are working to develop product emissions testing protocols and standards to certify products as “low-VOC” or “no-VOC.” Purchasers can look for labels such as USGBC and LEED®, GREENGUARD, UL Environment, Green Seal, and EcoLog, which certify green products.
- Sources: www.epa.gov.
Tools and Instruments Fact Sheet

**Air Quality Monitor** - Indoor air quality monitoring equipment may be available from a U.S. EPA regional office or from your state agency responsible for environmental quality in buildings. You may be able to borrow this equipment, or the agency may send a professional to your school to assist with air quality assessments. Look for monitors that will measure relative humidity, temperature, and carbon dioxide. These are available for purchase online and something to consider when applying for grants. Air quality monitors measure CO2, relative humidity and temperature in one tool. An average price is around $200 on the web.

OR here’s the three tools in an air quality monitor broken out in pricing individually.

- **Hygrometer** - determines relative humidity. The comfort of a classroom or school building can have a direct effect on student achievement, attitude, and overall ability to concentrate. Hygrometers may be purchased through local stores for less than $10. Also, some County Extension Offices may come out and perform a relative humidity test for your school. Find your Extension Office at: [http://www.ksre.ksu.edu/Map.aspx](http://www.ksre.ksu.edu/Map.aspx)

High humidity may cause molds and mildews to grow which can trigger asthma and allergic reactions. For more information, see the Fact Sheet that follows: “Schools, Molds, and Indoor Air Quality.”

- **Thermometer or Infrared Temperature Gauge** - a regular thermometer or an infrared temperature gauge is that you can point it at an object and get a quick readout of the surface temperature. The cost of a typical infrared temperature gauge starts at $25.

- **Carbon Dioxide Meters** - Elevated CO2 levels may cause drowsiness, lethargy, and a general sense that the air is stale. Most heating, ventilation, and air conditioning systems (HVAC) recirculate a significant portion of the indoor air to maintain comfort and reduce energy costs associated with heating or cooling outside air. When occupants and building operators sense air coming out of an air supply duct, it’s virtually impossible to judge how much of this air is simply recirculated air and how much is outside air. Current technology allows easy and relatively inexpensive measurement of carbon dioxide (CO2) as an indicator to help ensure that ventilation systems for high-density occupancy zones are delivering the recommended minimum quantities of outside air to the building’s occupants. The cost of a CO2 meter can be found for under $70.
Recommended Ranges for Relative Humidity, Carbon Dioxide and Temperature

The following ranges for temperature, relative humidity, and CO2 levels are recommended by US. EPA Indoor Air Quality Tools for Schools program and the American Society of Heating, Refrigeration, and Air Conditioning Engineers:

**Temperature:**
Summer (AC): 74-79 Fahrenheit if building is occupied; can be raised to 80 degrees if unoccupied. (23-26 Celsius)
Winter (heat on) 68-75 Fahrenheit if building is occupied; can be lowered to 66 degrees if unoccupied. (20-24 Celsius)

**Relative Humidity:**
Relative humidity should be in the range of 30-60 percent. Humidity levels above 60 percent encourage microbial buildup and are thus a health concern.

**Carbon Dioxide (CO2):**
Indoor CO2 levels should not exceed 1,000 parts per million (ppm).

**Resource:** The U.S. EPS’s Indoor Air Quality Tools for Schools kit contains more information on indoor air quality. For more information on this resource, visit [https://www.epa.gov/iaq-schools](https://www.epa.gov/iaq-schools)

Sources: [www.energy.wsu.edu/Documents/CO2inbuildings.pdf](http://www.energy.wsu.edu/Documents/CO2inbuildings.pdf); [www.doh.wa.gov/Portals/1/Documents/Pubs/333-044.pdf](http://www.doh.wa.gov/Portals/1/Documents/Pubs/333-044.pdf)
Part 12: Curriculum Connections

Project Learning Tree Curriculum Connections - Healthy School Environment
Project Learning Tree has a variety of environmental education curriculum materials that support and enhance the Healthy School Environment Investigation. Through these activities, students will learn about indoor air quality issues and transportation choices and about the effects those issues and choices have on our environment.

Preschool – 8th Grade- PLT’s PreK-8 Environmental Education Guide:

#14 Renewable or Not? - Students learn the terms renewable, nonrenewable, recyclable, and reusable; then they discover why sustainable use of natural resources is important.

#36 Pollution Search - Students take a closer look at pollution: what it is, what its sources are, and what people can do.

#53 On the Move - Students compare various transportation methods for getting to and from school, and they examine research transportation systems used in their community.

#55 Planning the Ideal Community - Students survey the area around their school to look for components of the human community in which they live. They then plan an ideal community that meets all the needs of its residents.

#57 Democracy in Action - Students learn about the roles and responsibilities of citizens’ groups in environmental policies and decision-making and about how young people can become involved in the process.

#72 Air We Breathe - Students will learn about indoor air quality at home and at school and about ways that they can assess and improve indoor air quality.

#84 The Global Climate - Students will learn about the relationship between carbon dioxide (CO2) and the Earth’s climate, and they will explore ways to reduce the amount of CO2 they generate.

#85 In the Driver’s Seat - Students keep a log of their family’s transportation for a week, learn how petroleum is refined, and then explore fuel conservation and energy efficiency by simulating the distance they can travel using different vehicles.

#86 Our Changing World - To help students see how changing one aspect of our world affect others, students make a graphic organizer connecting natural resources, energy, and human activities. They also research a global issue, thereby gaining an understanding of some of the issues facing us today as a global citizen.
#96 Improve Your Place- Students learn about the steps involved in developing a service learning project. They plan and conduct a project that focuses on making positive environmental changes in their community.

PLT’s Preschool–8th Grade Materials

*Energy & Society Activity Guide* - (Energy Education PreK–8; Available online at www.plt.org/energy-society-kit.)

#4 What Powers the Move?- Students will examine transportation systems vital to their community. They will identify transportation methods and design a future transportation system for their community.

#5 In the Driver’s Seat- Students learn about different fuels, and then explore fuel conservation and efficiency by simulating the distance they can travel on a set amount of gasoline using different vehicles.

#6 Energy Challenge Game- Students review energy concepts and information through a game similar to Jeopardy.

PLT Secondary Level Materials

*Exploring Environmental Issues: Focus on Risk*

#1 What Is Risk? - We encounter many types of risks every day. What is meant by the term “risk”? What types of risks do we encounter daily? Are all risks equally likely to occur? Are they all harmful? Why are we willing to take some risks but not others? Is anything really 100 percent risk free? In this activity, students will work together to explore these and other questions as they discuss, develop, and refine their definition and concept of risk and of risk assessment.

#2 Things Aren’t Always What They Seem- Students will identify their perception of the relative degree of risk associated with technologies, environmental hazards, and everyday activities. They will also have the opportunity to share their ideas as they compare and contrast their perceptions with those of others, including experts and lay people.

#5 Communicating Risk- Understanding risk is an integral part of the risk management process. It is critical that risk information is communicated effectively to all concerned parties. This activity allows students to explore how timely and responsible communication among experts, the media, and lay people can lead to improved decisions about risk management.
#6 Weighing the Options: A Look at Tradeoffs- Managing risk includes deciding which option is best at reducing risks. The process requires incorporating the data obtained from risk assessments plus the social, ethical, cultural, economic, and political values of the time. In this activity, students will explore the risk management process for personal choices while “grocery shopping.” They will also debate the use of cost or benefit analysis for making public policy decisions using the protection of endangered species as an example.

#8 Taking Action: Reducing Risk in Your School or Community- Students will identify a risk in their school or community. Then they will develop a plan to assess the risk, decide the best way to reduce the risk, educate others, and—if feasible—implement their plan.

Explore Environmental Issues: Places We Live

#7 Far-Reaching Decisions- Students develop graphic organizers and creative presentations to illustrate how individual decisions can affect the local environment, as well as distant communities. They will also measure their own ecological footprint.