Check Up

Teacher's Guide for Assessing Natural Resources in Maryland Schools

Maryland Environmental Design Program
Education, Bay Policy and Growth Management
Maryland Department of Natural Resources

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INTRODUCTION

Check Up is a teacher's guide provided by the Environmental Design Program of the Maryland Department of Natural Resources. This teacher's guide is designed for grades 6-12 and provides an opportunity for teachers and students to participate in implementing the following commitment of the Chesapeake Bay Agreement: *Provide students and teachers alike with opportunities to directly participate in local restoration and protection projects, and to support stewardship efforts in schools and on school property.*

Check Up provides teachers and students with information to enable them to identify and implement natural resources planning and management strategies that are both environmentally sensitive and economically sound. Students conduct natural resource assessments at their school and learn first hand how to better live in harmony with the natural environment by conserving energy and water, and reducing waste. Schools that participate in ***Check Up*** also have the unique opportunity to serve as models by demonstrating sound land use practices on site.

In addition, ***Check Up*** participation can be applied toward the certification requirements for receiving the **Governor's Green School Award** through the **Maryland Association for Environmental and Outdoor Education**.

The Check Ups

The **Energy Check Up** teaches students to identify the ways that energy is used at their school, read and understand an electric meter and electric bill, and calculate the amount of energy used by and the cost of running specific appliances. Students then devise a plan to reduce energy consumption, and calculate potential monetary and energy savings from their plan. Finally, students prepare a presentation to bring before their principal or school board to suggest implementing changes based on the savings.

The **Water Check Up** teaches students to identify the ways that water is used at their school, read and understand a water meter and water bill, calculate the amount of water used by specific fixtures, and calculate the amount of water wasted by leaky fixtures. Students then devise a plan to reduce water waste, and calculate potential monetary and water savings from their plan. Finally, students prepare a presentation to bring before their principal or school board to suggest implementing changes based on the savings.

The **Waste Check Up** teaches students to identify types of waste produced at their school, and calculate the volume of waste produced each day, month and year. Students then devise a plan for waste reduction, and calculate potential monetary savings from their plan. Finally, students prepare a presentation to bring before their principal or school board to suggest implementing changes based on the savings.

ENERGY CHECK UP

Lesson Goal:

Students will learn to:

- Identify the ways that energy is used at their school.
- Read and understand an electric meter and electric bill.
- Calculate the amount of energy used by specific appliances.
- Calculate the cost of running specific appliances.
- Devise a plan to reduce energy consumption.
- Calculate potential monetary and energy savings from their plan.

Maryland Learning Outcomes:

Grades 6-8, Environmental Science 2
Grades 6-8, Science 1.1 - 1.8
Grades 6-8, Science 2.3 - 2.7
Grades 6-8, Science 3.1 - 3.3
Grades 6-8, Science 4.2

Materials Needed:

- School electric bills
- School electric meter readings
- Student handouts

Lesson Value:

Electric power plants are one of the largest sources of air pollution in the United States. In 1999, these power plants emitted approximately 2.2 billion tons of carbon dioxide, 12 million tons of sulfur dioxide, and 7 million tons of nitrogen oxides into the earth's atmosphere. The release of these greenhouse gases into our atmosphere is the primary cause of global warming.

Air pollution from power plants also contributes to water quality problems. For example, in the Chesapeake Bay nitrogen from air pollution accounts for approximately one third of the nitrogen pollution in the Bay.

Air pollution created by power plants also contributes to human health problems such as asthma, bronchitis, cancer and other lung diseases.

Reducing the amount of energy that we use in our homes, work and schools can significantly reduce the amount of air pollution that we create. Saving energy also reduces our use of nonrenewable, natural resources such as coal, petroleum, and natural gas.

Pre-Assessment Checklist:

This checklist can be done by the teacher and/or the students.

1. Identify administrative offices and individuals responsible for energy use at your school (for example: the custodial/maintenance director).
2. Obtain copies of electric bills and electric meter readings for the past year. (Check with your custodial/maintenance director and your school district office.)
3. Identify and list major energy users at the school (heating, cooling, lights, computers).
4. Interview key individuals to learn top energy consuming activities and possible measures to conserve energy.

Introduction:

Begin the lesson with a discussion about energy. Questions to cover:

- What is energy?
- Where does energy come from?
- How do we make energy?
- How does energy production affect the environment?
- How do we use energy?
- How does energy use affect the environment?
- Why should we conserve energy?
- How can we conserve energy?
- What is an energy assessment?
- Why should we do an energy assessment?

Energy Curriculum Resources:

The resources below are examples of curricula that can be used in combination with the energy assessment.

GREEN SCHOOLS

Alliance to Save Energy

Download K-12 energy curriculum from the Alliance to Save Energy website.

Contact: www.ase.org
202-857-0666
info@ase.org

GET SMART ABOUT ENERGY

The U.S. Department of Energy

A CD-ROM with over 250 energy activities aligned with National Science Education Standards. This CD-ROM is specifically designed to help teachers quickly find and print reproducible science education lessons and activities about energy.

Contact: 800-363-3732

POWER UP! MARYLAND POWER PLANT CURRICULUM WRITING PROJECT

Anne Arundel County Public Schools and MD DNR

Energy production curriculum for grades 4 through 8. The curriculum covers five topics:

1) What is Electricity?; 2) How is Electricity Produced? Power Plants in Maryland; 3) Using Electrical Energy; 4) Environmental Impacts; and 5) Energy Conservation.

Contact: 410-222-3823
Paul DeRoo

Energy Assessment:

Take a school tour to determine school energy usage.

1. Take an inventory of appliances that use electricity and document approximately how much electricity each appliance uses.

	A	B	C	D	E
Electrical Appliance	**Wattage**	**# hours used per month**	**Watts used per month (A x B)**	**KWH used per month (C/1000)**	**Cost to run per month (D x electric company cost per KWH)**
Incandescent lights					
Fluorescent lights					
Computers					
Air conditioner					
Electric Heater					
Electric Space Heater					
Other					

2. Calculate the cost per month to run each appliance
   a. Determine wattage of an item (if wattage is not available, multiply amperage times voltage to get an estimate)
   b. Wattage x the number of hours an item is used each month = watts used per month
   c. Watts used per month divided by 1,000 = number of kilowatt hours (KWH) the item consumed in that month
   d. KWH x electric company's rate per KWH = the amount you pay to run the item in a month

3. Measure Natural Gas usage and cost
   - BTU = how much gas an item uses in an hour
   - Multiply BTU times hourly usage for each month
   - Multiply BTU usage times the rate paid per hour (If your gas company charges per therm, first divide the BTU by 100,000, and then multiply it by the gas company's rate per therm.)

4. Identify places in the school where energy is wasted using the school energy checklist.

	Yes	No	Notes
Lighting			
Are lights off in unoccupied rooms?			
Are lights off in unoccupied common areas (cafeterias, gymnasiums, meeting areas, choral or band rooms)?			
Are outside lights turned off late at night (from 11:30 PM to 5:30 AM)?			
Are outside lights turned off during the day?			
Does your school use energy efficient light bulbs?			
HVAC Settings			
Air-conditioning set between 74 and 78 degrees?			
Heating set between 68 and 72 degrees?			
HVAC set back after school (78 degrees in summer, 66 in winter)?			
Exhaust fans turned off after school?			
Occupant Operations			
Is equipment off in unoccupied rooms?			
Are computers off in unoccupied areas (PC monitors turned off when not needed)?			
Are blinds closed after school?			
Are doors and windows closed when A/C or heating is in operation?			
Is there heat or cooling loss at the windows (do you feel cool air leaking inside on cold days)?			
Maintenance/Custodial Operations			
Are coils clean?			
Are timers set properly (lights, hot water heaters, etc.)?			
Other Energy Uses			
What other ways is energy used at your school?			

5. Based on the energy checklist, propose ways to reduce energy usage.

6. Calculate potential energy savings for each proposed change.
   For example:
   - Calculate new amount of energy used per month if classroom lights are turned on for fewer hours each day.

7. Calculate potential monetary savings for each proposed change.
   For example:
   - Calculate new cost per month if classroom lights are turned on for fewer hours each day.

8. Implement energy saving ideas and compare overall energy costs to the same month in the previous year.
   To calculate overall school energy savings:
   - Use the school's electric meter to record daily, weekly or monthly energy use.
   - Compute total electric energy used by school each week or month and compare this amount to the same month of the previous year.

9. Graph potential and real energy savings based on the results of your calculations.
   - Plot week, month, or year on X axis and savings on Y axis.

10. Graph potential and real cost savings based on the results of your calculations.
    - Plot week, month, or year on X axis and savings on Y axis.

DID YOU KNOW?

Replacing one incandescent light bulb with a compact florescent bulb will reduce the same amount of CO2 in the atmosphere as planting 34 trees.

How many light bulbs can you replace? This is the same as planting how many trees?

Summarize Results:

Prepare a presentation to bring before your principal or school board. Describe your plan to save energy at your school and document your estimates of energy savings and monetary savings. Include reasons for saving energy and how it helps the health of students, school staff, community residents and the environment.

Next Steps:

Tell your parents about your energy assessment assignment and conduct an energy assessment at your home. How much can you reduce energy usage at home and how much can you save on your parent's energy bill?

Energy Assessment Resources:

GREEN SCHOOLS

Alliance to Save Energy

This program combines installation of energy-efficient technology with implementation of management techniques and student learning/direct involvement and focuses on environmental and cost benefits of the changes.

Contact: www.ase.org
202-857-0666
info@ase.org

MARYLAND ENERGY ADMINISTRATION

The Maryland Energy Administration advises Maryland government on directions, policies and changes in the various segments of the energy market. Its mission is to maximize energy efficiency while promoting economic development, reducing reliance on foreign energy supplies, and improving the environment.

Contact: www.energy.state.md.us
800-72-ENERGY
mea@energy.state.md.us

PROJECT GREEN MACHINE

Marion County Public Schools, Florida

This program is an environmental resource conservation program and includes classroom curricula and extra-curricular activities about energy, water, recycling and land. The program also supports the school district in meeting local community environmental compliance requirements and offers monetary incentives to participate.

Contact: www.projectgreenmachine.org
352-671-6907
Rob Van Der Like
vanderlr@marion.k12.fl.us

WATER CHECK UP

Lesson Goal:

Students will learn to:

- Identify the ways that water is used at their school.
- Read and understand a water meter and water bill.
- Calculate the amount of water used by specific fixtures.
- Calculate the amount of water wasted by leaky fixtures.
- Devise a plan to reduce water waste.
- Calculate potential monetary and water savings from their plan.

Maryland Learning Outcomes:

Grades 6-8, Environmental Science 2
Grades 6-8, Science 1.1 - 1.8
Grades 6-8, Science 2.3 - 2.7
Grades 6-8, Science 3.1 - 3.3
Grades 6-8, Science 4.2

Materials Needed:

- School water bills
- Student handouts
- Cups, buckets and /or beakers to collect and measure water

Lesson Value:

Although the world is covered by 70 percent water, only 2.5 percent of the water is freshwater. Of this, less than one percent is accessible for human use. And while water has the characteristics of a renewable resource, water appropriate for human use can become scarce if it is not used and managed sustainably. According to the United States Geological Survey (1995), the United States consumes 261 billion gallons of water a day for domestic use. Domestic use includes water for normal household purposes, such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens.

The buildings that we live and work in are not as water efficient as they could be. According to a study conducted by the American Water Works Association Research Foundation, a typical single family home uses 72.5 gallons of water per person a day. By installing readily available water efficient fixtures and appliances and taking measures to minimize leaks, the use of water can be reduced to under 40 gallons per person a day.

Pre-Assessment Checklist:

This checklist can be done by the teacher and/or the students.

1. Identify administrative offices and individuals responsible for water use at your school (for example: the custodial/maintenance director).
2. Obtain copies of water bills and water meter readings for the past year. (Check with your custodial/maintenance director and your school district office.)
3. Identify and list major water users at the school (sprinklers, bathrooms, gym showers).
4. Interview key individuals to learn top water consuming activities and possible measures to conserve water.

Introduction:

Begin the lesson with a discussion about water. Questions to cover:

- How much of the Earth is covered by water?
- How much of this is salt water?
- How much of this is fresh water?
- How much of the fresh water is accessible for human use?
- Is water distributed equally throughout the world?
- What are some ways that we use water?
- Why should we conserve water?
- What is a water assessment?
- Why should we do a water assessment?

Water Curriculum Resources:

The resources below are examples of curricula that can be used in combination with the water assessment.

MAGNIFICENT GROUND WATER CONNECTION

New England Interstate Water Pollution Control Commission

This ground water curriculum includes the basic concepts of the water cycle, water distribution, treatment and stewardship.

Contact: 978-323-7929
mail@neiwpcc.org
www.neiwpcc.org

PROJECT WET, WATER EDUCATION FOR TEACHERS

Montana State University

The goal of Project WET is to facilitate and promote the awareness, appreciation, knowledge, and stewardship of water resources through the development and dissemination of classroom ready teaching aids and through the establishment of state and internationally sponsored Project WET programs.

Contact: Project WET
PO Box 170575, Montana State University, Bozeman, MT 59717-0575
www.projectwet.org
projectwet@montana.edu
406-994-5392

In Maryland: Cindy Grove
cgrove@dnr.state.md.us
410-260-8716

THE WATER SOURCEBOOK SERIES

LEGACY - Partners in Environmental Education

The Water Sourcebooks contain 324 activities for grades K-12 divided into four sections: K-2, 3-5, 6-8, and 9-12. Each section is divided into five chapters: Introduction to Water, Drinking Water and Wastewater Treatment, Surface Water Resources, Ground Water Resources, and Wetlands and Coastal Waters. The sourcebooks can be downloaded from the EPA website.

Contact: 334- 270-5921
www.epa.gov/safewater/kids/wsb/

Water Assessment:

INDOOR WATER USE

Take a school tour to determine school water usage.

1. Take an inventory of water consuming fixtures, and document approximately how much water each fixture uses.

	A	B	C	D	E
Water Fixture	**# of uses per day**	**# of gallons per use**	**# of gallons used per day (A x B)**	**Cost per gallon from water bill**	**Cost per day (C x D)**
Bathroom sink faucets					
Toilets					
Urinals					
Drinking fountains					
Showers					
Indoor swimming pool					
Hot water heating pipes/AC					
Boiler					
Utility closets					
Indoor sprinkler system					
Cooling towers					
Other					

2. Calculate the cost per day for use of the fixtures.
   a. Calculate number of gallons used per day by each fixture
      - # of uses per day x # of gallons per use = # of gallons used per day
   b. Find out the cost per gallon of water from the school water bill
   c. Determine the cost per day for use of the fixtures
      - # of gallons used per day x cost per gallon = cost per day

3. Measure wasted water from leaky faucets.
   a. Put a cup or bucket under the leak and time it for five minutes.
   b. Measure the amount of water collected.

c. Multiply:
   - Amount of water collected x 12 = water wasted in one hour
   - Water wasted in one hour x 24 = water wasted per day from that faucet
   - Add water wasted from all leaks to get total water wasted per day

	A	B	C
Water Fixture	**Amount of water wasted in 5 minutes**	**Amount of water wasted in 1 hour (A x 12)**	**Water wasted per day (B x 24)**
Bathroom sink faucets			
Drinking fountains			
Other			

4. Identify and list fixtures that could be replaced.

5. Calculate daily water savings that would result from basic renovations.
   Example calculations:
   a. Calculate how much water would be saved by repairing leaky faucets.
      - Amount of water wasted per faucet per day x number of faucets repaired = amount of water saved per day
   b. Calculate how much water would be saved by replacing hi-flow toilets.
      - Amount of water used per flush of current toilet – amount used per flush by low-flow toilet = amount of water saved per flush
      - Amount saved per flush x number of flushes per day = amount of water saved per day by each toilet replacement
      - Amount of water saved per day by each toilet replacement x number of toilets replaced = total water saved per day

6. Calculate yearly monetary savings that would result from basic renovations.
   - Determine cost per gallon of water from water bill
   - Cost per gallon x gallons of water saved = monetary savings on water bill
   - Monetary savings on water bill – cost per repair = actual monetary savings

DID YOU KNOW?

Repairing a leaky toilet can save 200 gallons of water per day or 73,000 gallons of water per year.

How many gallons of water can you save?

7. Graph potential and real indoor water savings based on the results of your calculations.
   - Plot week, month, or year on X axis and savings on Y axis.

8. Graph potential and real cost savings based on the results of your calculations.
   - Plot week, month, or year on X axis and savings on Y axis.

OUTDOOR WATER USE

Tour school grounds to determine outdoor water usage.

1. Take an inventory of water consuming fixtures, and document approximately how much water each fixture uses.

	A	B	C	D	E
Water Fixture	**# of uses per day**	**# of gallons per use**	**# of gallons used per day (A x B)**	**Cost per gallon from water bill**	**Cost per day (C x D)**
Outside faucets					
Sprinkler system					
Outdoor pool					
Fountain					
Pond					
Other					

2. Calculate the cost per day for use of the fixtures using the same technique as for indoor faucets.

3. Measure any leaks from outdoor faucets using the same technique as for indoor faucets.

	A	B	C
Water Fixture	**Amount of water wasted in 5 minutes**	**Amount of water wasted in 1 hour (A x 12)**	**Water wasted per day (B x 24)**
Outside faucets			
Other			

4. Identify fixtures that could be made more efficient.
   For example:
   - Drip irrigation
   - Timers on sprinklers
   - Covers on pools to reduce evaporation

5. Consider other avenues for outdoor water conservation.
   For example:
   - Roof water catchment (rain barrels) for watering lawns or landscaping
   - Water lawns at the time of day that will minimize evaporative loss (early morning)
   - Adjust sprinkler heads to reduce water that is wasted by watering asphalt
   - Plant an eco-lawn (grass that requires minimal watering, fertilizer and mowing)
   - Plant native, drought-resistant plants and trees
   - Make a list of other ideas that you think of

6. Calculate (or estimate) potential water savings from repairs, replacements, or other water conservation techniques.
   For example:
   - Measure the number of gallons collected in barrels from roof water catchment
   - Estimate the number of gallons saved by adjusting sprinkler heads away from asphalt
   - Research how much less watering an eco-lawn requires compared to conventional lawns

7. Calculate monetary savings from reducing outdoor water usage with the same equations as for indoor water use.

8. Graph potential and real outdoor water savings based on the results of your calculations.
   - Plot week, month, or year on X axis and savings on Y axis.

9. Graph potential and real cost savings based on the results of your calculations.
   - Plot week, month, or year on X axis and savings on Y axis.

INDOOR AND OUTDOOR WATER USE

Calculate monetary savings from reducing indoor and outdoor water usage by adding the two together.

Summarize Results:

Prepare a presentation to bring before your principal or school board. Describe your plan to save water at your school and document your estimates of water savings and monetary savings. Include reasons for saving water and how it helps people and the environment.

Next Steps:

Tell your parents about your water audit assignment and conduct a water assessment at your home. How much can you reduce your water usage at home and how much can you save on your parent's water bill?

Water Assessment Resources:

CONSERVE WATER! EDUCATORS' GUIDE

The Watercourse/International Project WET Programs

This educators' guide provides a detailed school water audit for teachers and students.

Contact: The Watercourse
PO Box 170575, Montana State University, Bozeman, MT 59717-0575
www.projectwet.org/watercourse
conservewater@montana.edu
406-994-1916

In Maryland: Cindy Grove
cgrove@dnr.state.md.us
410-260-8716

WATERWISER

American Water Works Association

This program is a resource for water efficiency and water conservation information.

Contact: www.waterwiser.org
800-926-7337
bewiser@waterwiser.org

WASTE CHECK UP

Lesson Goal:

Students will learn to:

- Identify types of waste produced at their school.
- Calculate the volume of waste produced each day, month and year.
- Devise a plan for waste reduction.
- Calculate potential monetary savings from their plan.

Maryland Learning Outcomes:

Grades 6-8, Science 1.1 - 1.8
Grades 6-8, Science 2.3 - 2.7
Grades 6-8, Science 3.1 - 3.3
Grades 6-8, Science 4.2

Materials Needed:

- Waste bills
- Recycling bills
- Large trash cans
- Large trash bags
- Large scale for weighing the trash
- Student handouts

Safety – Please note that there may be sharp or other dangerous objects in the trash. For this reason, the following protective gear should be worn when handling the trash or trash bags:

- Leather gloves
- Goggles
- Lab coat

Lesson Value:

In 1999, U.S. residents, businesses, and institutions produced more than 230 million tons of municipal solid waste. This adds up to approximately 4.6 pounds of waste per person per day, up from 2.7 pounds per person per day in 1960. All of this waste ends up in landfills, which are costly to construct and maintain and adversely affect our environment.

Reducing waste and recycling saves energy, conserves natural resources, helps protect the environment, slows the filling of landfills, and saves money. Energy is saved because recycling requires less energy than producing new products like aluminum cans or paper. For example,

recycling aluminum saves 95 percent of the energy needed to produce the aluminum from ore and recycling paper saves 64 percemt of the energy needed to produce it from trees. Natural resources are conserved, especially when we recycle metal and paper. Using recycled office paper saves 24 trees for every ton of paper used and using recycled newsprint saves 12 trees for every ton of newsprint used. In addition, by reducing the amount of waste we generate, we help minimize the threat posed by harmful substances within the waste stream. Recycling also reduces the volume of waste that must be incinerated or landfilled. Finally, money is saved because prolonging the life of landfills reduces the cost of capping old and constructing new landfills. The cost of capping a landfill at capacity is $80,000-$500,000 per acre and the cost of constructing a new landfill is up to approximately $1 million per acre.

Pre-Assessment Checklist:

This checklist can be done by the teacher and/or the students.

1. Identify administrative offices and individuals responsible for waste management at your school (for example: the custodial/maintenance director).
2. Gather information on how much money is spent for waste management at your school. (Check with your custodial/maintenance director and your school district office.)
3. Obtain copies of waste bills for the past year.
4. Find out if there is a school recycling program. If so, obtain copies of recycling bills for the past year.
5. Find out how often waste is picked up from the school.
6. What has been done so far to reduce, reuse and recycle waste?
7. If possible, find out how much solid waste was landfilled, incinerated, recycled, or composted.
8. Where is the most waste generated in the school? Where is waste being reduced, reused or recycled in the school?

Introduction:

Begin the lesson with a discussion about waste. Questions to cover:

- What is waste?
- What are the different kinds of waste generated at school?
- What are the different kinds of waste generated at home?
- What happens to waste?
- What is a landfill?
- Why should we reduce waste going into landfills?
- How can we reduce waste going into landfills?
- What are the three Rs – Reuse, Reduce, Recycle?
- Why are the three Rs important?
- What is recycling?
- How does recycling help the environment?
- What is a waste assessment?
- Why should we do a waste assessment?

Waste Curriculum Resources:

The resources below are examples of curricula that can be used in combination with the waste assessment.

LETS REDUCE AND RECYCLE: CURRICULUM FOR SOLID WASTE AWARENESS

Environmental Protection Agency

This curriculum can be ordered from the RCRA hotline.

Contact: 800-424-9346

THE WISE PROJECT: WASTE INFORMATION SERIES FOR EDUCATION

Michigan United Conservation Clubs

Curriculum designed to teach sound waste management and pollution prevention.

Contact: 800-777-6720
www.mucc.org

Waste Assessment:

1. Tour the school to study and record the types of solid waste generated.
2. Plan a waste assessment day at school.
3. Determine what equipment and space will be needed for the assessment.
4. Set up containers for lunchtime separation and collection of trash.
5. Measure other trash from classrooms.
6. Create a chart to record the types and amounts/weight collected (see below).
7. Display the trash the next day so that students and school staff can visually see how much is generated each day.

	A	B	C
Type of waste	**Weight collected on waste assessment day**	**Number of school days per month**	**Weight per month (A x B)**
Office paper			
Cardboard			
Newspaper			
Telephone books			
Ink-jet cartridges			
Laser-jet cartridges			
Plastic			
Aluminum cans			
Non-recyclables			
Other			

8. Create a list of suggested waste reduction or recycling activities for your school.
   For example:
   - Washable dishes instead of disposable
   - Reusable mug program
   - Double-sided copying policies

9. Calculate the potential waste reduction from implementing these activities.
   For example:
   a. How many pounds of waste would be eliminated from the lunchroom trash if washable dishes were used instead of disposable?
      - Weight of plastic utensils collected on waste audit day + weight of disposable dishes collected on waste audit day = total pounds of waste eliminated

   b. How many pounds of waste would be eliminated if a reusable mug program were implemented?
      - Total weight of soda cans + plastic bottles + paper cups and other drinking containers collected on waste audit day.

   c. How many pounds of waste would be eliminated if double-sided coping policies were implemented?
      - Weight of single-sided copies collected on waste audit day divided by 2.

10. Calculate potential savings based on the proposed activities.
    For example:
    - Recycling companies will provide monetary compensation for paper, plastic and aluminum waste that has been separated.
    - Research the current value for the different types of recyclable materials.
    - Value x weight of material = amount earned for the material

11. Graph potential and real waste reduction based on the results of your calculations.
    - Plot week, month, or year on X axis and amount reduced on Y axis.

DID YOU KNOW?

Recycling one person's paper and cardboard waste can reduce 2.8 pounds of landfill waste per day or 1,022 pounds of landfill waste per year.

How many pounds of waste can you reduce?

12. Graph potential and real cost savings based on the results of your calculations.
    - Plot week, month, or year on X axis and savings on Y axis.

Summarize Results:

Prepare a presentation to bring before your principal or school board. Describe your plan to reduce waste at your school and document your estimates of waste reduction and monetary savings. Include reasons for reducing waste and how it helps people and the environment.

Next Steps:

Tell your parents about your waste audit assignment and conduct a waste assessment at your home. How much waste can you reduce at home and how would this reduction save money?

Waste Assessment Resources:

WASTE AUDIT MANUAL

Ijams Nature Center

Nature Center in Knoxville, Tennessee. The Ijams Nature Center website provides a detailed manual of how to conduct a school waste audit.

Contact: www.ijams.org/Pages/ef_audit.htm
865-577-4717
jlane@ijams.org

WASTE AUDITS FOR SCHOOLS

The Recycling Council of Ontario

This organization promotes environmental sustainability through waste minimization and resource conservation, and provides waste reduction information for home, work, and schools.

Contact: www.rco.on.ca/factsheet/fs_d01.html
rco@rco.on.ca

ACTION PROJECTS/ SERVICE LEARNING

Below are some suggestions for extending these lessons by taking action at school or at home.

Stormwater Management:
Bayscape your yard or school grounds by planting native drought tolerant plants and trees.

For more information: www.fws.gov/r5cbfo/Bayscapes.htm

Wildlife Habitat:
Organize a schoolyard habitat project to create or restore local wildlife habitat.

For more information: www.fws.gov/r5cbfo/Schoolyd.htm or 410-573-4500

Energy Conservation:
Install Energy Star appliances to reduce energy consumption and compare energy use before and after installation.

For more information: www.energy.state.md.us

Waste Reduction:
Build a compost to reduce yard and food scrap waste in landfills.

For more information: www.epa.gov/epaoswer/non-hw/reduce/catbook/compost.htm

What else can you do to help the environment?

ADDITIONAL RESOURCES

BALTIMORE GAS & ELECTRIC

The BGE website provides information on gas and electric energy, how it is generated, how to calculate costs of running appliances, how to read bills, how to save energy, and other topics.

Contact: www.bge.com

ENVIRONMENTAL EDUCATION CENTER

Environmental Protection Agency

This section of the EPA website offers curriculum resources for air, ecosystems, waste and recycling, conservation, human health, and water.

Contact: www.epa.gov/teachers

GREEN SCHOOLS PROGRAM

Maryland Association for Environmental and Outdoor Education

Maryland public and non-public schools are encouraged to become "Green Schools" by meeting specific environmental education criteria. Criteria include integrating environmental studies into school curricula, using best environmental practices in operation and design of school buildings, and reaching out to the community through projects that address local environmental issues. Schools that meet the criteria receive the Governor's Green School Award flag at an awards ceremony and recognition on the MAEOE website.

Contact: www.maeoe.org
410-260-8713
Kate Clavijo
kate.clavijo@verizon.net

GREEN SCHOOLS

Alliance to Save Energy

This program combines installation of energy-efficient technology with implementation of management techniques and student learning/direct involvement. Focuses on environmental and cost benefits of the changes.

Contact: www.ase.org
202-857-0666
info@ase.org

MARYLAND DEPARTMENT OF THE ENVIRONMENT

The Maryland Department of the Environment provides environmental education materials for both students and the general public.

Contact: www.mde.state.md.us
410-631-3314

MARYLAND ENVIRONMENTAL DESIGN PROGRAM

Maryland Department of Natural Resources

The Environmental Design Program was created to assist the development community and local governments to find innovative ways to reduce nutrient input from development activities. The Environmental Design Program works directly with building industry professionals, local governments, and citizens to provide the information and on-site technical assistance they need to identify and implement environmentally sensitive and cost-effective building and site design techniques with the goal of preventing pollution and damage to Maryland's living resources.

Contact: www.dnr.state.md.us/smartgrowth/greenbuilding/index.html
410-260-8827
Matthew Fleming
Program Manager
Environmental Design Program
mfleming@dnr.state.md.us

PROJECT GREEN MACHINE

Marion County Public Schools, Florida

This program is an environmental resource conservation program and includes classroom curricula and extra-curricular activities about energy, water, recycling and land. The program also supports the school district in meeting local community environmental compliance requirements and offers monetary incentives to participate.

Contact: www.eemaf.org/PGM1/pgm-pag1.html
352-671-6900
Rob Van Der Like
vanderlr@marion.k12.fl.us

SCHOOLYARD HABITAT PROJECT GUIDE

U.S. Fish and Wildlife Service

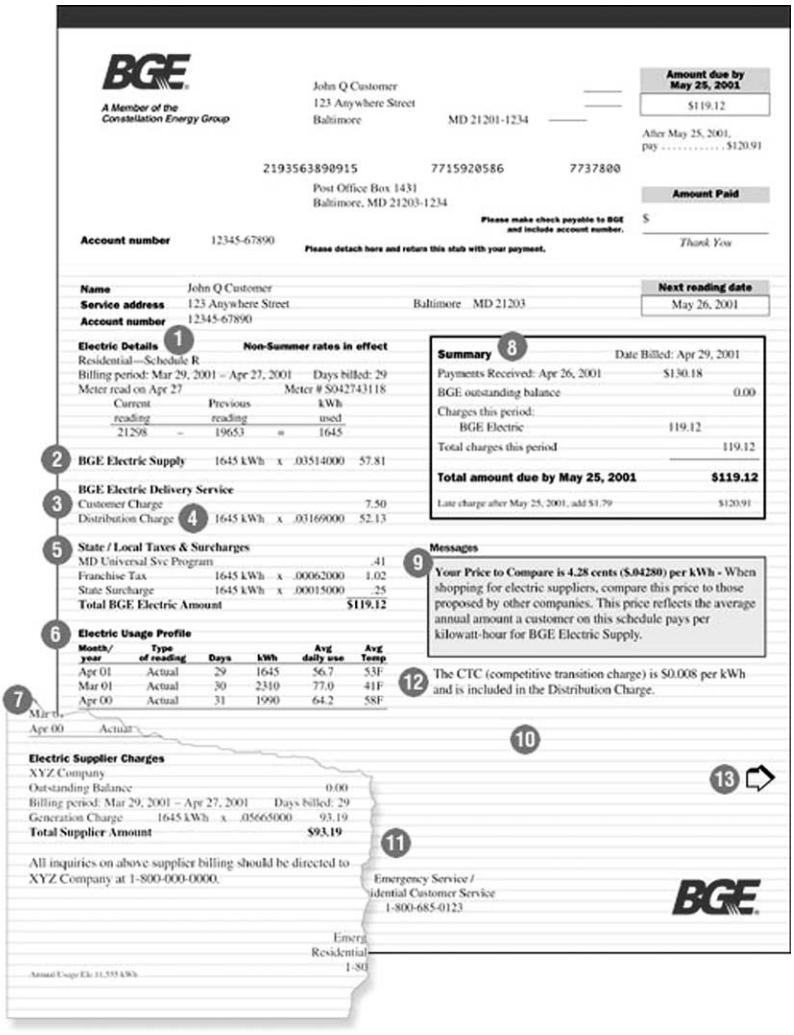
This guide provides the basic steps needed to restore or create wildlife habitat. It is designed so that students can establish a forest, meadow or wetland on school grounds.

Contact: www.fws.gov/r5cbfo/
410-573-4593
410-573-4500

APPENDIX

Sample Electric Bill:

Obtained from www.bge.com



1. **Electric Details**
   Electric Details include your rate schedule, the billing period covered by this bill, the date of your last meter reading, your meter number, and how much electricity you used this billing period.

2. **BGE Electric Supply**
   BGE Electric Supply will appear if you choose to continue buying your electric supply from us. The charge includes the cost of generating and transmitting electricity to BGE's distribution system.

BGE Electric Delivery Service includes (3 & 4):

3. **Customer Charge**
   Customer Charge covers expenses not directly associated with the generation or delivery of energy, such as billing, metering, and meter reading. This charge is the same each month.

4. **Distribution Charge**
   Distribution Charge covers the cost of delivering the electricity you use each month through BGE's distribution system to your home.

5. **State/Local Taxes & Surcharges**
   State/Local Taxes & Surcharges are required by the State of Maryland to be collected, then passed on to the State. Some surcharges and assessments are used to fund environmental, social, and other governmental programs.

6. **Electric Usage Profile**
   Electric Usage Profile shows your electric use during the current period compared to the same periods last year and last month.

7. **Electric Supplier Charges**
   Electric Supplier Charges will appear here if you have chosen a supplier other than BGE. The charge includes the cost of generating and transmitting electricity to BGE's distribution system, the billing period, and outstanding and current balance. Also listed is your supplier's telephone number.

8. **Summary Box**
   Summary Box lets you know the bottom line of what you owe to BGE. It shows the latest BGE and Supplier payment(s), BGE outstanding balance(s), charges for the current billing period, and late charges that will be added if the bill is not paid on time.

9. **Your Price to Compare**
   Your Price to Compare is the price per kilowatt-hour you can use to compare prices among electric suppliers. This price reflects the average amount a customer on your rate schedule pays per kilowatt-hour on an annual basis. The price has been averaged over a year since summer and non-summer rates differ. For Time of Use customers, energy costs in the various time periods were also factored.

10. **Messages**
    Messages concerning your account will be shown in the lower right hand portion of your bill.

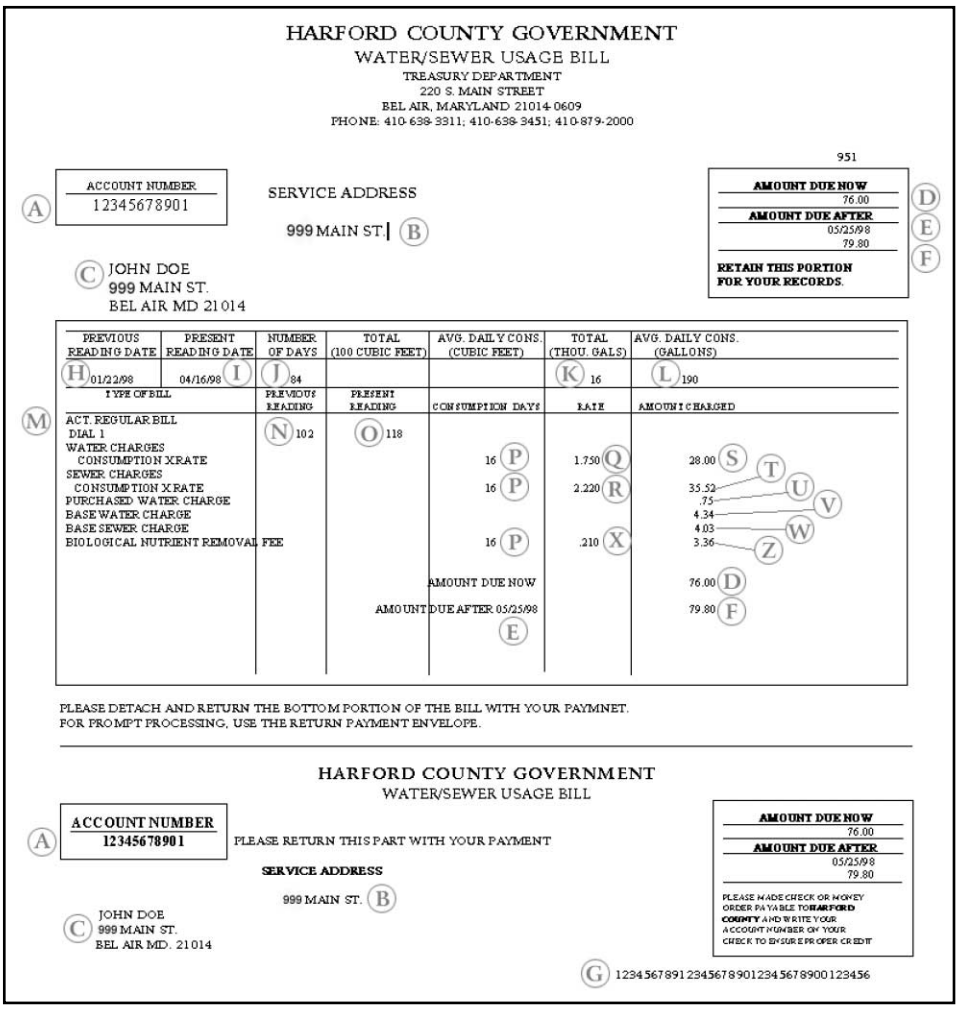
11. **Gas Details**
    Gas Details will appear here for natural gas customers. It provides the same sort of information found under Electric Details.

12. **Competitive Transition Charge**
    Competitive Transition Charge is included on every customer's bill and is designed to recover investments in assets such as power plants that were built to ensure customers would have a reliable and adequate supply of electricity. This is not a new charge but is now stated separately on the bill.

13. **Telephone numbers and a glossary of terms**
    Telephone numbers and a glossary of terms can still be found on the back of the bill.

Sample Water Bill:

Obtained from www.co.ha.md.us



HARFORD COUNTY GOVERNMENT
WATER/SEWER USAGE BILL
TREASURY DEPARTMENT
220 S. MAIN STREET
BEL AIR, MARYLAND 21014-0609
PHONE: 410-638-3311; 410-638-3451; 410-879-2000

951

(A) ACCOUNT NUMBER 12345678901

SERVICE ADDRESS
999 MAIN ST (B)

(C) JOHN DOE
999 MAIN ST.
BEL AIR MD 21014

AMOUNT DUE NOW (D) 76.00
AMOUNT DUE AFTER (E) 05/25/98 79.80 (F)
RETAIN THIS PORTION FOR YOUR RECORDS.

PREVIOUS READING DATE	PRESENT READING DATE	NUMBER OF DAYS	TOTAL (100 CUBIC FEET)	AVG. DAILY CONS. (CUBIC FEET)	TOTAL (THOU. GALS)	AVG. DAILY CONS. (GALLONS)
(H) 01/22/98	04/16/98 (I)	(J) 84			(K) 16	(L) 190

TYPE OF BILL (M)	PREVIOUS READING	PRESENT READING	CONSUMPTION DAYS	RATE	AMOUNT CHARGED
ACT. REGULAR BILL					
DIAL 1	(N) 102	(O) 118			
WATER CHARGES					
CONSUMPTION XRATE			16 (P)	1.750 (Q)	28.00 (S)
SEWER CHARGES					
CONSUMPTION XRATE			16 (P)	2.220 (R)	35.52 (T)
PURCHASED WATER CHARGE					.75 (U)
BASE WATER CHARGE					4.34 (V)
BASE SEWER CHARGE					4.03 (W)
BIOLOGICAL NUTRIENT REMOVAL FEE			16 (P)	.210 (X)	3.36 (Z)
			AMOUNT DUE NOW		76.00 (D)
			AMOUNT DUE AFTER 05/25/98 (E)		79.80 (F)

PLEASE DETACH AND RETURN THE BOTTOM PORTION OF THE BILL WITH YOUR PAYMNET.
FOR PROMPT PROCESSING, USE THE RETURN PAYMENT ENVELOPE.

HARFORD COUNTY GOVERNMENT
WATER/SEWER USAGE BILL

(A) ACCOUNT NUMBER 12345678901

PLEASE RETURN THIS PART WITH YOUR PAYMENT

SERVICE ADDRESS
999 MAIN ST. (B)

(C) JOHN DOE
999 MAIN ST.
BEL AIR MD. 21014

AMOUNT DUE NOW 76.00
AMOUNT DUE AFTER 05/25/98 79.80
PLEASE MADE CHECK OR MONEY ORDER PAYABLE TO **HARFORD COUNTY** AND WRITE YOUR ACCOUNT NUMBER ON YOUR CHECK TO ENSURE PROPER CREDIT

(G) 12345678912345678901234567890012345 6

Information Contained on the Water-Sewer Bill Statement

A. Account Number - This number identifies your account. Always refer to this number in your communications to the Water & Sewer Billing Department.

B. Service Address - Where the meter is located.

C. Mailing Address - Bills will be mailed to this address. Property owners or agents should notify the Water & Sewer Accounting Department if bills are to be forwarded to another address.

D. Amount Due Now - The bill amount if payment is made promptly. This amount includes current water-sewer charges plus any previous charges that have not been paid.

E. Penalty Date - This account will be penalized if payment is not received by this date. A five percent (5%) penalty is applied to the unpaid amount of your bill.

F. Amount Due After - The bill amount if payment is made after the penalty date. This amount includes current water-sewer charges plus any previous charges which have not been paid plus a five percent (5%) penalty applied to the unpaid amount of your bill.

G. Scan Line - This line contains numbers that are used to process your payment.

H. Previous Reading Date - The meter reading date of your previous water-sewer bill.

I. Present Reading Date - The meter reading date for your current water-sewer bill.

J. Number of Days - The time in days between meter readings.

K. Water Total 1000s Gallons - The total quantity of water service provided during the current billing period measured in gallons.

L. Average Daily Consumption - The average daily consumption of water service during the current billing period measured in gallons.

M. Type of Bill - The type of reading used to produce this bill:
ACT - Actual Reading EST - Estimated Reading

N. Previous Reading - The meter setting for the previous meter reading.

O. Present Reading - The meter setting at the time of the current meter reading.

P. Consumption - The volume of water furnished in 1,000's of gallons.

Q. Water Rate - The rate charged for each 1,000 gallons of water furnished.

R. Sewer Rate - The rate charged for each 1,000 gallons of wastewater processed.

S. Water Amount Charge - The amount charged for current water service

T. Sewer Amount Charge - The amount charged for current sewer service.

U. Purchased Water Charge - The amount charged for the purchase of water from sources other than Harford County.

V. Base Water Charge - The amount charged each customer to pay for the service of 24-hour on-call water maintenance and billing services.

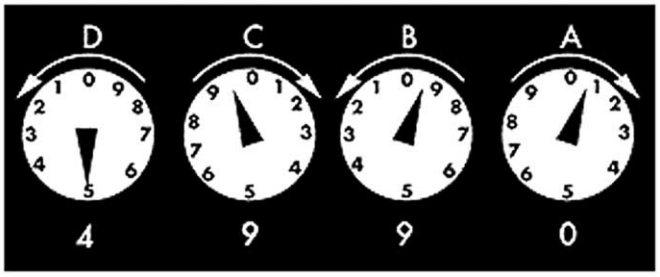
W. Base Sewer Charge - The amount charged each customer to pay for the service of 24-hour on-call sewer maintenance and billing services.

X. Biological Nutrient Removal Rate - The rate charged for each 1,000 gallons of wastewater processed.

Z. Biological Nutrient Removal Rate Fee - The amount charged is to recover the capital construction costs of installing biological nutrient removal process at the Sod Run Wastewater Treatment Plant.

How to read an electric meter:

Read the meter dials from right to left. Note that alternate dials move in opposite directions. This is important in taking an accurate reading. In the example below, start with Dial A on the right and read to Dial D on the left. If a pointer is clearly between numbers, the smaller number (as in Dial A) is recorded, unless the dial is between 9 and 0; in this case (as in Dial B and Dial C), 9 was recorded. If a pointer is close to or exactly on a number (as in Dial D), look at the dial to the right (dial C). If that pointer has not yet reached zero, the smaller number is recorded (see the reading on Dial D). Notice that the pointer on Dial C has not reached zero. So the reading for Dial D is recorded as 4, not 5.



Obtained from www.pepco.com

How to read a water meter:

To read the meter, start from the left side and read only the first four digits.

The first meter reads 28 units of water (one unit equals 1000 gallons).

The second meter shows 36 units of water.

The difference, or water consumed for the measuring period, is eight units or 8,000 gallons.

Obtained from www.cityofparsons.com

Energy Check Up – Amount of Electricity Used Before Proposed Changes

Take an inventory of appliances that use electricity and calculate the cost per month to run each appliance.

a. Determine wattage of an item (if wattage is not available, multiply amperage times voltage to get an estimate)
b. Wattage x the number of hours an item is used each month = watts used per month
c. Watts used per month divided by 1,000 = number of kilowatt hours (KWH) the item consumed in that month
d. KWH x electric company's rate per KWH = the amount you pay to run the item in a month

	A1	B1	C1	D1	E1
Electrical Appliance	**Wattage**	**# hours used per month**	**Watts used per month (A1 x B1)**	**KWH used per month (C1/1000)**	**Cost to run per month (D1 x electric company cost per KWH)**
Incandescent lights					
Fluorescent lights					
Computers					
Air conditioner					
Electric heater					
Electric space heater					
Other					

Energy Check Up – School Energy Checklist Part 1

Identify places in the school where energy is wasted using the school energy checklist.

Lighting	Yes	No	Notes
Are lights off in unoccupied rooms?			
Are lights off in unoccupied common areas (cafeterias, gymnasiums, meeting areas, choral or band rooms)?			
Are outside lights turned off late at night (from 11:30 PM to 5:30 AM)?			
Are outside lights turned off during the day?			
Does your school use energy efficient light bulbs?			
HVAC Settings			
Air-conditioning set between 74 and 78 degrees?			
Heating set between 68 and 72 degrees?			
HVAC set back after school (78 degrees in summer, 66 in winter)?			
Exhaust fans turned off after school?			

Energy Check Up – School Checklist Part 2

Identify places in the school where energy is wasted using the school energy checklist.

Occupant Operations	Yes	No	Notes
Is equipment off in unoccupied rooms?			
Are computers off in unoccupied areas (PC monitors turned off when not needed)?			
Are blinds closed after school?			
Are doors and windows closed when A/C or heating is in operation?			
Is there heat or cooling loss at the windows (do you feel cool air leaking inside on cold days)?			
Maintenance/Custodial Operations			
Are coils clean?			
Are timers set properly (lights, hot water heaters, etc.)?			
Other Energy Uses			
What other ways is energy used at your school?			

Energy Check Up – Amount of Electricity Used After Proposed Changes

Propose changes, such as turning lights on for fewer hours, and calculate the new cost per month to run each appliance.

a. Determine wattage of an item (if wattage is not available, multiply amperage times voltage to get an estimate)
b. Wattage x the number of hours an item is used each month = watts used per month
c. Watts used per month divided by 1,000 = number of kilowatt hours (KWH) the item consumed in that month
d. KWH x electric company's rate per KWH = the amount you pay to run the item in a month

	A2	B2	C2	D2	E2
Electrical Appliance	**Wattage**	**# hours used per month**	**Watts used per month (A2 x B2)**	**KWH used per month (C2/1000)**	**Cost to run per month (D2 x electric company cost per KWH)**
Incandescent lights					
Fluorescent lights					
Computers					
Air conditioner					
Electric heater					
Electric space heater					
Other					

Energy Check Up – Potential Energy and Monetary Savings

Calculate potential monetary savings for each proposed change.
For example: Calculate new cost per month if classroom lights are turned on for fewer hours each day.

a. List the electrical appliances below
b. Subtract: D1 (from chart 1) minus D2 (from chart 2) = Potential KWH saved per month
c. Subtract: E1 (from chart 1) minus E2 (from chart 2) = Potential money saved per month

Electrical Appliance	Potential KWH saved per month (D1–D2)	Potential $ saved per month (E1–E2)

Indoor Water Check Up – Amount of Indoor Water Used Before Proposed Changes

Take an inventory of water consuming fixtures, document approximately how much water each fixture uses and calculate the cost per day for use of the fixtures.

a. Calculate number of gallons used per day by each fixture (# of uses per day x # of gallons per use = # of gallons used per day)
b. Find out the cost per gallon of water from the school water bill
c. Determine the cost per day for use of the fixtures (# of gallons used per day x cost per gallon = cost per day)

	A1	B1	C1	D1	E1
Water Fixture	**# of uses per day**	**# of gallons per use**	**# of gallons used per day (A1 x B1)**	**Cost per gallon from water bill**	**Cost per day (C1 x D1)**
Bathroom sink faucets					
Toilets					
Urinals					
Drinking fountains					
Showers					
Indoor swimming pool					
Hot water heating pipes/AC					
Boiler					
Utility closets					
Indoor sprinkler system					
Cooling towers					
Other					

Indoor Water Check Up – Water Wasted from Leaks

Measure wasted water from leaky fixtures.

a. Put a cup or bucket under the leak and time it for five minutes
b. Measure the amount of water collected
c. Multiply:
   - Amount of water collected x 12 = water wasted in one hour
   - Water wasted in one hour x 24 = water wasted per day from that faucet
d. Add water wasted from all leaks to get total water wasted per day

	A	B	C
Water Fixture	**Amount of water wasted in 5 minutes**	**Amount of water wasted in 1 hour (A x 12)**	**Water wasted per day (B x 24)**
Bathroom sink faucets			
Drinking fountains			
Other			

Indoor Water Check Up – Amount of Indoor Water Used After Proposed Changes

Propose changes, such as fixing leaky faucets or replacing hi-flow toilets. Then document approximately how much water each fixture uses and calculate the new cost per day for use of the fixtures.

a. Calculate number of gallons used per day by each fixture (# of uses per day x # of gallons per use = # of gallons used per day)
b. Find out the cost per gallon of water from the school water bill
c. Determine the cost per day for use of the fixtures (# of gallons used per day x cost per gallon = cost per day)

	A2	B2	C2	D2	E2
Water Fixture	**# of uses per day**	**# of gallons per use**	**# of gallons used per day (A2 x B2)**	**Cost per gallon from water bill**	**Cost per day (C2 x D2)**
Bathroom sink faucets					
Toilets					
Urinals					
Drinking fountains					
Showers					
Indoor swimming pool					
Hot water heating pipes/AC					
Boiler					
Utility closets					
Indoor sprinkler system					
Cooling towers					
Other					

Indoor Water Check Up – Potential Indoor Water and Monetary Savings

Calculate yearly monetary savings that would result from basic renovations.

a. List water fixtures below
b. Calculate: D1 (from chart 1) minus D2 (from chart 2) x 30 = Potential water saved per month
c. Calculate: E1 (from chart 1) minus E2 (from chart 2) x 30 = Potential money saved per month

Water Fixture	Water saved per month (D1-D2) x 30	Potential $ saved per month (E1-E2) x 30

Outdoor Water Check Up – Amount of Outdoor Water Used Before Proposed Changes

Take an inventory of water consuming fixtures, document approximately how much water each fixture uses and calculate the cost per day for use of the fixtures.

a. Calculate number of gallons used per day by each fixture (# of uses per day x # of gallons per use = # of gallons used per day)
b. Find out the cost per gallon of water from the school water bill
c. Determine the cost per day for use of the fixtures (# of gallons used per day x cost per gallon = cost per day)

	A1	B1	C1	D1	E1
Water Fixture	**# of uses per day**	**# of gallons per use**	**# of gallons used per day (A1 x B1)**	**Cost per gallon from water bill**	**Cost per day (C1 x D1)**
Outside faucets					
Sprinkler system					
Outdoor pool					
Fountain					
Pond					
Other					

Outdoor Water Check Up – Water Wasted from Leaks

Measure wasted water from leaky fixtures.

a. Put a cup or bucket under the leak and time it for five minutes
b. Measure the amount of water collected
c. Multiply:
   - Amount of water collected x 12 = water wasted in one hour
   - Water wasted in one hour x 24 = water wasted per day from that faucet
d. Add water wasted from all leaks to get total water wasted per day

	A	B	C
Water Fixture	**Amount of water wasted in 5 minutes**	**Amount of water wasted in 1 hour (A x 12)**	**Water wasted per day (B x 24)**
Outside faucets			
Other			

Outdoor Water Check Up – Amount of Outdoor Water Used After Proposed Changes

Propose changes, such as putting timers on sprinklers, collecting water in rain barrels for watering plants, or putting covers on pools to reduce evaporation. Then document approximately how much water each fixture uses and calculate the new cost per day for use of the fixtures.

a. Calculate number of gallons used per day by each fixture (# of uses per day x # of gallons per use = # of gallons used per day)
b. Find out the cost per gallon of water from the school water bill
c. Determine the cost per day for use of the fixtures (# of gallons used per day x cost per gallon = cost per day)

	A2	B2	C2	D2	E2
Water Fixture	**# of uses per day**	**# of gallons per use**	**# of gallons used per day (A2 x B2)**	**Cost per gallon from water bill**	**Cost per day (C2 x D2)**
Outside faucets					
Sprinkler system					
Outdoor pool					
Fountain					
Pond					
Other					

Outdoor Water Check Up – Potential Indoor Water and Monetary Savings

Calculate yearly monetary savings that would result from basic renovations.

a. List water fixtures below
b. Calculate: D1 (from chart 1) minus D2 (from chart 2) x 30 = Potential water saved per month
c. Calculate: E1 (from chart 1) minus E2 (from chart 2) x 30 = Potential money saved per month

Water Fixture	Water saved per month (D1-D2) x 30	Potential $ saved per month (E1-E2) x 30

Waste Check Up – Amount of Waste Generated Before Proposed Changes

Use the chart below to record the amount of waste collected on waste audit day.

a. Set up containers for lunchtime separation and collection of trash
b. Collect other trash from classrooms
c. Using a scale, weigh the different types of trash collected and record in column A1
d. Determine the number of school days in each month and record in column B1
e. Multiply: A1 x B1 = total weight of trash generated each month

	A1	B1	C1
Type of Waste	**Weight collected on waste assessment day**	**Number of school days per month**	**Weight per month (A1 x B1)**
Office paper			
Cardboard			
Newspaper			
Telephone books			
Ink-jet cartridges			
Laser-jet cartridges			
Plastic			
Aluminum cans			
Non-recyclables			
Other			

Waste Check Up – Ways to Reduce, Reuse, and Recycle

List suggested waste reduction or recycling activities for your school. For example: washable dishes instead of disposable, reusable mug program, or double-sided copying policies. Think of some of your own ideas.

Type of Waste	How to Reduce	How to Reuse	How to Recycle

On the back of this page, calculate the potential waste reduction from implementing these and your own activities.
For example:

a. How many pounds of waste would be eliminated from the lunchroom trash if washable dishes were used instead of disposable?
   - Weight of plastic utensils collected on waste audit day + weight of disposable dishes collected on waste audit day = total pounds of waste eliminated

b. How many pounds of waste would be eliminated if a reusable mug program were implemented?
   - Total weight of soda cans + plastic bottles + paper cups and other drinking containers collected on waste audit day = total pounds of waste eliminated

c. How many pounds of waste would be eliminated if double-sided coping policies were implemented?
   - Weight of single-sided copies collected on waste audit day divided by 2 = total pounds of waste eliminated

Waste Check Up – Amount of Waste Generated After Proposed Changes

Use the chart below to determine potential waste reduction based on your proposed changes.

a. Record how much less trash would be collected after your changes are made in column A2.
b. Record the number of school days per month in column B2.
c. Calculate the new weight generated each month in column C2.

	A2	B2	C2
Type of Waste	**Weight collected on waste assessment day**	**Number of school days per month**	**Weight per month (A2 x B2)**
Office paper			
Cardboard			
Newspaper			
Telephone books			
Ink-jet cartridges			
Laser-jet cartridges			
Plastic			
Aluminum cans			
Non-recyclables			
Other			

Waste Check Up – Potential Waste Reduction and Monetary Savings

Calculate potential waste reduction and monetary savings based on the proposed activities.

a. List type of waste below
b. Subtract: C1 (from chart 1) minus C2 (from chart 2) = Potential waste reduced per month
c. Research recycling companies to determine potential monetary savings.
   - Recycling companies will provide monetary compensation for paper, plastic and aluminum waste that has been separated.
   - Research the current value for the different types of recyclable materials.
   - Value x weight of material = amount earned for the material

Type of Waste	Potential waste reduced per month (C1-C2)	Potential $ saved per month

2003 APPLICATION

GOVERNOR'S GREEN SCHOOLS AWARD PROGRAM

ELIGIBILITY

1. Application must be postmarked by **March 7, 2003** and sent to:
   Maryland Association for Environmental and Outdoor Education
   Post Office Box 2104
   Annapolis, Maryland 21401

2. All public and private preK-12 schools within the State of Maryland are eligible.

3. All activities described in this application should reflect activities that have occurred or will occur during the **September 2001– June 1, 2003** school years.

4. Applications must include three parts:
   Part I - Cover Sheet
   Part II - Green School Summary
   Part III - Documentation of Green School requirements for your school.

REVIEW AND RECOGNITION PROCESS

1. Questions about the application or the review process should be referred to:
   Kate Clavijo
   Phone: 202 342-1521
   E-mail: kate.clavijo@verizon.net

2. Your application must be postmarked by **March 7, 2003**.

3. Once the application is received, the Review Panel meets to evaluate the application. All schools that meet all three criteria will be recommended for the award. If the review panel has any questions about the application, the panel may conduct a site visit or interview with the school.

4. All schools will be notified of their status by late March 2003.

5. A recognition ceremony for recipients of the award will be held in April 2003.

PREPARING THE APPLICATION

The application that you will complete should provide the Review Panel with information that will help them to understand why your school is a unique and successful Green School. Please visit the MAEOE website for a description of the goal of the Governor's Green School Award Program. To be considered for review, your application package must contain the following information:

❑ Part 1 - Cover Sheet

The School Cover Sheet must be completed and signed by the principal.

❑ Part II - A Summary of Your School's Green School Activities

This **one page summary** should provide a concise and coherent "snapshot" of your school that describes how your school is representative of a Green School.

❑ Part III -Documentation of Required Criteria for Green School Recognition

To be eligible for the Green School Award, your school ***must*** demonstrate that it has met at least the required criteria for each of the three Green School objectives. **Your application will not be reviewed if the application does not support the minimum requirements.**

The requirements for Green School Recognition include the following:

Objective 1: Curriculum and Instruction - achieve all 3 criteria
Objective 2: Operation and Design of School Building - achieve 4 of the 8 criteria
Objective 3: School Community - achieve one of the 2 criteria

The documentation section of the application includes a written description that details how your school has accomplished the requirements for a Green School. Limit your descriptions to no more than one page per criteria. Supporting materials that will verify these achievements must also be attached. Refer to the Meeting the Requirements of a Green School for examples of accepted documentation.

The Review Panel will give special attention to applications that demonstrate students have been actively involved in preparing the application.

PART II

SUMMARY OF YOUR SCHOOL'S GREEN SCHOOL ACTIVITIES

This **one page summary** should provide a concise and coherent "snapshot" of your school that describes how your school is representative of a Green School. Summarize your strengths and accomplishments. Focus on what makes your school a unique and successful Green School worthy of State recognition. Highlight accomplishments using the three objectives of a Green School as a general guide.

The Summary section will provide the Review Panel with an introduction to your Green School activities and will also be used for public information if the school receives the distinction of the Governor's Green School Award. This information will be shared with other recognized schools, candidates for next year, and the press. It should be written as a stand-alone section

PART III

REQUIREMENTS FOR GREEN SCHOOL RECOGNITION

Objective 1 – Curriculum And Instruction

The school has developed a philosophy and approach to the development and implementation of curriculum and instruction that uses the environment as an integral part of the school's instructional program. The Green School Review Panel is interested in how your school has involved students in environmental issues instruction beyond what is required by the County curriculum.

Requirements for Objective 1
To be a Green School, your school must demonstrate that it meets all 3 of the following criteria.

Criteria – Curriculum and Instruction

1. **Environmental Issue Instruction**
   Students have opportunities at all grade levels and within multiple curricula to learn about, study, and address environmental issues in the classroom, on the school site, and in the local and regional community.

2. **Professional Development**
   Members of the school staff are involved in professional development or other training activities that enhance environmental awareness, literacy and knowledge and/or related instructional strategies.

3. **Celebration**
   The school recognizes and celebrates student and staff achievement in the implementation of best environmental practices in the operation and design of the school building and grounds and in developing active partnerships with the community.

Objective 2 – Operation and Design of School Building And Grounds

Best environmental practices are modeled in the operation and design of the school building and grounds — the school models what it teaches.

Requirements for Objective 2
To be a Green School, your school must demonstrate that it meets at least 4 of the 8 criteria.

Criteria – Operation and Design of School Building and Grounds

1. **Water Conservation and Water Pollution**
   The school and/or students practice water conservation and water pollution prevention.

2. **Energy Conservation**
   The school and/or students practice energy conservation.

3. **Solid Waste**
   The school and/or students practice solid waste reduction, reuse and recycling.

4 **Safe Use of Chemicals**
   The school purchases chemical products that are environmentally safe, uses the chemicals in ways that pose no environmental or human health risks, and ensures their proper disposal. The school uses Integrated Pest Management.

5. **Habitat Restoration**
   The school and/or students have designed and implemented natural habitat restoration areas on the school grounds or in the community.

6. **Building Structure for Learning about the Environment**
   The school has designed or implemented a variety of school or community structures that may enhance learning in the outdoors or improve habitat.

7. **Responsible Transportation**
   The school and/or students promote and provide responsible transportation.

8. **Healthy School Environment**
   The school buildings and grounds are managed and maintained to ensure that every student and staff member enjoys the benefits of clean air, clean water and a healthy learning environment.

Objective 3 – School Community

The school and students extend their learning into the community through a variety of projects that address local environmental issues.

Requirements for Objective 3
To be a Green School, your school must demonstrate that it meets one of the following criteria.

Criteria - School and Community

1. **Community Partners in the Local Community**
   The school encourages and supports student, staff, and community partnerships that address environmental issues in the local community.

2. **Community Partners at the School Level**
   Community partners encourage and support students and staff to develop and implement solutions to environmental issues at the school level.

For more information and assistance visit the Maryland Association of Environmental and Outdoor Education website at: http://www.maeoe.org

- State and local resources
- Funding opportunities
- Professional Development opportunities
- Mentoring opportunities
- Application Tips
- Recognized Governor's Green Schools for 1999, 2000, 2001 and 2002
- Green School Information Update

MAEOE

The Maryland Association for Environmental and Outdoor Education

TIPS FOR A SUCCESSFUL APPLICATION

Before you mail your application, review the following checklist to ensure that you have a successful application.

- ❑ Completed all information on the Cover Sheet.
- ❑ Completed a one page summary of your School's Green School Activities
- ❑ Objective 1 – Curriculum and Instruction includes:
  - a maximum 1 page description for each of the three required criteria
  - documentation is included for each criterion
  - labeled documentation identifies which criteria it supports
- ❑ Objective 2 – Operation and Design includes:
  - a maximum 1 page description for each of the four required criteria
  - documentation is included for each criterion
  - labeled documentation identifies which criteria it supports
- ❑ Objective 3 – School Community includes:
  - a maximum 1 page description for the one required criteria
  - documentation is included for each criterion
  - labeled documentation identifies which criteria it supports
- ❑ Documentation has been selected that best exemplifies how your school meets each criterion. Documents may include, but are not limited to photographs, student work, data, program or meeting agendas, certificates, specific lesson plans, calendars, maps, blue prints and newspaper articles. Do not include videos, computer discs, large posters or audio tapes as your documentation.
- ❑ Each section of the application is identified (index tabs work great!).
- ❑ Supporting documentation, labeled for each criterion, is placed immediately following the written description.
- ❑ The application reflects two years of environmental education in your school: September 2001 through June 2003
- ❑ Involve students in the writing and compiling the application
- ❑ The application is postmarked by March 7, 2003.

PART I

COVER SHEET

2003 APPLICATION

GOVERNOR'S GREEN SCHOOLS AWARDS PROGRAM

School Name: _____

School Address: _____

_____

_____

School System: _____

Name of Contact Person: _____ Email: _____

Phone: _____ Fax: _____

I have reviewed the information in this application and certify that to the best of my knowledge it is accurate.

_____

Principal's signature Date

Preparation of the Application:
An Award Nominations Committee should be involved in the preparation of the application. The committee should include at least one member from the following list: student, teacher, administrator, parent, community partner and maintenance staff. We encourage the active involvement of students in the development of your application. Please list all individuals involved in the preparation of your application.

Name	Position or Title