

**Recycling Technical Assistance  
Project #518  
Borough of Monaca, Beaver County, Pennsylvania  
Review of Recycling Education Practices in Schools**

**April 2013**

Sponsored by the Pennsylvania Department of Environmental Protection through  
the Pennsylvania State Association of Township Supervisors

**Prepared by:**



*"Working to protect the environment since 1939."*

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## **Problem Statement**

The Borough of Monaca (hereafter referred to as Monaca) requested assistance, “to work with [their] local schools in better educating students on the importance of recycling.” There are two schools located in Monaca, Central Valley Middle School (hereafter Central Valley) and Saint John the Baptist School (hereafter St. John). Currently, there is a great interest by the Borough in continuing to increase the rate of recycling, not just in schools, but in residential recycling, as well. Ideally, Monaca seeks to increase in-school recycling education in hopes that students will share this information at home, thus increasing recycling rates throughout the Borough.

The Pennsylvania Resources Council (hereafter referred to as PRC) was engaged, via the Pennsylvania Department of Environmental Protection’s (DEP) Recycling Technical Assistance (RTA) program to perform a comprehensive review of the in-school recycling education programs for Monaca. This included evaluating the current recycling systems in place at the schools, suggestions for implementation of recycling education within the schools, sample material (lesson plans, etc.), inclusion of additional materials and other areas relevant to the continuation, expansion, support and improvement of Monaca’s schools’ recycling education and waste minimization efforts.

PRC staff met with Central Valley and St. John staff to discuss current recycling education and recycling practices within the schools. The attached report includes PRC’s findings along with recommendations to help improve recycling education in Monaca’s schools.

## **Scope of Work**

In the Scope of Work, approved on October 24, 2012, PRC was to provide assistance to Monaca via a comprehensive review of the municipality’s current recycling education practices.

The tasks included in the Scope of Work were:

- Meet with key municipal, county, and school staff; review current practices and concerns
- Review current practices within schools and make recommendations for improvement
- Research recycling programs and education practices currently used in other municipalities and schools
- Develop final recommendations
- Follow-up meeting with Monaca
- Produce final report

## **Findings and Recommendations**

Currently, there are two schools located within Monaca: Central Valley Middle School, which serves students 6<sup>th</sup> through 8<sup>th</sup> grade; and, Saint John the Baptist School, which serves students prekindergarten through 8<sup>th</sup> grade. Both schools participate in a paper recycling program, primarily managed by the students. In this report, PRC looked at ways the schools could expand the students' knowledge on the importance of recycling. PRC started by looking at the schools' current recycling practices, the problems the schools encountered, and then made recommendations on expanding the education components of the program.

It is worth noting that during the research process for this project PRC found that Monaca's waste and recycling ordinance is in need of updating. In its current state the ordinance may put Monaca at risk for non-compliance with Pennsylvania State Act 101 related to requirements for mandated municipalities. At a minimum Monaca's recycling ordinance should clearly state what materials are required to be recycled by schools in the Borough along with the reporting requirements for the schools.

### **Current Recycling Operations**

One of the concerns from Borough Manager, Mario Leone, Jr., was that he received very little feedback from the haulers regarding the schools' recycling tonnages. He thought possible reasons might include: 1) the haulers have several stops before and after the schools so the haulers are unsure about the recycling rates for the schools specifically; or, 2) the schools simply are not recycling. He did mention that Monaca was receiving paper recycling rebates from Abitibi for their container at St. John.

To gain a better understanding of the problem, PRC met with school staff to discuss recycling operations at the schools. Below are specific details for each individual school's recycling program/practices:

#### **Central Valley Middle School**

PRC met with Brian Dolph, Dean of Students, who discussed the school's current recycling operations, followed by a tour of the building. Presently, the cafeteria has a single stream dumpster that is used by the back of house cafeteria staff only. This dumpster is serviced by Waste Management, Inc. and picked up every Friday. This dumpster is not used for student lunches or other school activities. In speaking with school personnel, it was mentioned that before the school merged with Center Area School District (forming Central Valley School District) Central Valley Middle School had a student operated recycling system in the cafeteria. However, there were several flaws in the system that eventually led to the program's end:

- Students were confused about what could and could not be recycled, especially under special circumstances (items from home, plastic bottles filled with liquid, etc.).
- Cafeteria staff complained that the students made a mess when disposing of their recyclables. Staff mentioned most of the recyclable material was plastic iced tea bottles. Too often students would throw open and/or full bottles into the recycling containers making things messy, sticky and smelly.
- Eventually the students who initiated and monitored the program moved on to the high school and without interest from the younger students, the program fell apart.

The only other recycling program in the school is a student organized paper collection. The 8<sup>th</sup> Grade Community Service Club started the program as a piggyback project that began in the high school. The students made paper recycling containers out of cardboard boxes and distributed them throughout the school. At present, the students rotate picking up the paper once or twice a week. This paper is

either brought to the high school or to the Abitibi Paper Retriever bin at St. John by the teacher that coordinates the student group, Sarah Woodward.

Sarah Woodward mentioned some frustrations the student club has had with the program:

- Lack of dedicated recycling containers, since the students used cardboard boxes often times the boxes get used for other things, then classrooms do not have (and therefore do not use) the recycling containers.
- Garbage gets thrown into the recycling boxes.
- General questions about what can and cannot be thrown in the recycling boxes (paper with tape, staples, etc.) and not knowing the answers.

### **St. John the Baptist School**

PRC met with Tony Giordano, Pastoral Associate, to discuss the recycling operations at St. John. Currently, the school only recycles paper and ink cartridges. Both are fundraising opportunities for the school. The paper recycling program is maintained primarily by students. Once a week students alternate jobs, which include the paper recycling responsibilities. According to Mr. Giordano, this program has gone very well. The students maintain the recycling bins with minimal problems. The students recycle paper into the cardboard boxes and rarely, if ever, throw garbage into the bins. Currently, no materials from the cafeteria, sporting events, or special events from the Parishioners are being recycled. Mr. Giordano thought some reasons may include:

- Recycling is not a priority at the school and consequently no one has taken initiative to start a program beyond paper. However, he did think that if someone took an interest and had some help there would be no resistance to extending the recycling program.
- The school is in need of recycling containers with clear labels that include large, bright pictures for the younger students.
- Lastly, recycling education is needed. Mr. Giordano thought if students learned early and grew up with the system, it would become second nature, as it has with the paper recycling program. He also mentioned that the school would benefit from recycling education designed to include everyone that enters the school, including the parishioners that use the schools on evenings and weekends.

It should be noted that Mr. Giordano mentioned the last school he worked for had a great recycling program; students were taught at an early age what to recycle in the school. The school had several recycling bins throughout the building, with pictures for the younger students. He noticed that as the students grew up with the system it became second nature. The students would also help each other when there was confusion. It is recommended that Monaca and St. John use Mr. Giordano's experience and take the opportunity to learn how a similar program might benefit St. John.

Also, St. John's waste disposal contract expires in 2014. Ideally, Mr. Giordano would like to add recycling to the contract. It might be beneficial if he could get some help negotiating a new contract that includes recycling. Presently, local hauler, Joseph J. Brunner, Inc. handles the waste for St. John. The main benefit to using this hauler is flexibility. For example, if there are several special events at the school they can easily schedule an extra pick-up. Preferably, the school would like to keep the flexibility with the added bonus of adding recycling.

### Beyond Paper Recycling

In order to get students to think more about recycling, not just in their schools, but in their communities as well, it is recommended that both schools look to expand their recycling program to include other materials, especially plastic in the cafeterias and after school activities. However,

schools may be hesitant to expand their recycling program for reasons that may include cost, time, waste contracts, and extra work. This provides an opportunity for Monaca to help the schools address the following concerns:

- What materials are going to be recycled?
- How will the materials be collected?
- Where will the materials be stored?
- How will the materials be hauled?
- What are the costs associated with the expansion of the program?

Monaca should also make it clear what their expectations are for the schools. At a minimum, regarding recycling in schools, Monaca should include:

- Specific recycling requirements for schools and special events
- When schools should report hauler information

Since both schools have limited experience with recycling beyond paper, Monaca could encourage the schools to work together. The schools may find a new program easier to handle if they can share information, frustrations, concerns, and solutions. Student clubs could also elaborate on each other's ideas.

Another opportunity would be to get students involved in the solution. Students should be encouraged to have a large role in the program. If they feel responsible for the program, there is a greater chance for success and minimalizing problems. Students should keep records and set goals. The achievements, even small ones, should be celebrated and success stories should be shared.

#### Increasing Recycling Education and Awareness

By expanding their recycling program, the schools will be able to create continued opportunity for growth and education. A school recycling program creates a learning experience for everyone involved. Students, teachers, staff, and parents not only learn about recycling, but also about sustainability in their community. It is important to work with the schools to help educate, not only what materials can be recycled, but why students should recycle, how they can recycle, and how they can apply this knowledge at school and at home.

Opportunities for assistance:

- Providing schools with municipal recycling information. It is important for students, teachers, and other staff to know what can and cannot be recycled in Monaca. It is also important for them to know how, where, and why to recycle.
- Make the information as fun and engaging as possible. Some sample materials are included in **Appendix C**.
- Seek outside help. There are several organizations that offer in-school conservation programs, including PRC. PRC offers recycling and resource conservation classes to students of all ages.
- Encourage teachers to use integrated lesson plans, incorporating academic standards for Environment and Ecology. **Appendix A** includes Pennsylvania's Academic Standards. **Appendix B** includes sample lesson plans.

Opportunities beyond the classroom:

- Education that includes teachers, maintenance workers, cafeteria staff, PTA, Parishioners, after school program organizers, and anyone else that may be involved in recycling at the school through signs and recycling containers, memos, mailings, staff meetings, etc.

- Provide schools and students with take home materials that can be shared with families. This can be a workbook that they work on with a parent, a survey that tallies what is being recycled at home, coloring pages with information about what can and cannot be recycled in Monaca, or anything that is going to bring the recycling information home.
- Remember, if recycling education is made to be fun rather than a chore, there is a greater chance that the students will educate parents (siblings, peers, etc.).
- St. John mentioned they had a great PTA. Getting the PTA involved might provide an opportunity to bring recycling education into the schools as well as bring it home.

### Student Involvement

Student involvement often determines the success of a program. Students should be encouraged to take the reins as often as possible to insure long term success, continued education, and community education. Opportunities that allow students to become teachers may also increase the success of the program. Allowing students to be creative in their solutions will also make it fun and engaging.

Recommendations for student involvement:

- Encourage schools to have an Environmental Club, Sustainability Club, or Green Team. This club should include multiple grade levels, ensuring that senior members will educate newer club members. The younger club members can, in turn, carry on the information and the program when the eighth graders move to the high school.
- Allow students to take ownership; assist and guide them as needed.
- Consider starting a recycling competition or a poster contest that promotes recycling.
- Student, teacher, and staff achievement should be recognized. This can be done through awards, special promotions, newspaper announcements, etc.

### Beyond Recycling – Taking Your Schools to the Next Level

As the recycling programs continue to grow and as students and staff become more comfortable with recycling, it is recommended that both schools look at other ways to reduce their waste. Both schools could benefit from a waste reduction plan and move beyond basic recycling, further increasing their diversion rates.

#### **Waste Minimization**

One way the schools could look to reduce their waste could be in the cafeteria. Each cafeteria uses Polystyrene (commonly known as Styrofoam) trays. Central Valley has about 565 students across three lunch periods and St. John has about 145 students (not including pre-k and special events). If only half of the student population buys a school lunch that still equates to 355 polystyrene trays entering the waste stream on a daily basis or 639,000 in a 180 day school year. Since a reusable, washable tray may not be an option, schools could look into other disposable trays, either paper, compostable, or recyclable.

#### **Composting**

Another way to divert waste is through composting. Composting also offers students an interactive way to learn about waste reduction. Composting could allow the school to take small steps and work their way to a larger waste reduction goal.

Some examples of composting include:

- Worm composting – Ideal for classroom composting
- Backyard/schoolyard composting – Schools can also explore a backyard composting system, to divert food scraps and schoolyard waste.

- Lastly, schools can look at composting to solve a much larger waste problem. Schools can partner with local farmers that will take large amounts of food scraps and other compostable waste. The farmers will then make use of the compost on their farm, guaranteeing a win-win.

*Appendix D* includes educational resources for minimalizing school waste.

### **Conclusion**

The importance of having a balanced in-school recycling education program goes beyond increasing recycling rates within the school. By teaching students the importance of recycling in their younger years, they learn responsibility, to take action, and to share their knowledge with others in their community. As an end result, recycling becomes habit. As a municipality, it is important to help set your schools up for as much success as possible. There is importance in starting small, taking increasing larger steps along the way, building the program up in small manageable steps, and finding ways to reward students and schools that implement an exemplary recycling system. Lastly, it is important to know that these things take time, education, and resources.

### **Summary of Recommendations**

- Help schools update current recycling practices to include more than paper recycling.
- Provide, if possible, proper bins and clear signage including detailed pictures or, at the very least, guidance in obtaining these.
- Encourage schools to work together, problem solve, etc.
- Incorporate recycling into lesson plans and units of study.
- Provide fun, informative, take home packets for students.
- Get students, staff, and parents involved.
- Recognize and reward those that participate.

## Appendix A – Pennsylvania Academic Standards for Environment and Ecology

Sections 4.2 Renewable and Non-Renewable Resources, 4.3 Environmental Health, 4.8 Humans and the Environment, and 4.9 Environmental Laws and Regulations are attached for reference. The highlighted standards apply specifically to recycling and resource conservation.

The complete list of Environment and Ecology Standards can be found here:

[http://www.portal.state.pa.us/portal/server.pt/gateway/PTARGS\\_0\\_123531\\_1244111\\_0\\_0\\_18/EEStandards.pdf](http://www.portal.state.pa.us/portal/server.pt/gateway/PTARGS_0_123531_1244111_0_0_18/EEStandards.pdf)

## Academic Standards for Environment and Ecology

4.2. Renewable and Nonrenewable Resources			
4.2.4. GRADE 4	4.2.7. GRADE 7	4.2.10. GRADE 10	4.2.12. GRADE 12
<i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills needed to:</i>			
<p>A. Identify needs of people.</p> <ul style="list-style-type: none"> <li>Identify plants, animals, water, air, minerals and fossil fuels as natural resources.</li> <li>Explain air, water and nutrient cycles.</li> <li>Identify how the environment provides for the needs of people.</li> </ul> <p>B. Identify products derived from natural resources.</p> <ul style="list-style-type: none"> <li>Identify products made from trees.</li> <li>Identify by-products of plants and animals.</li> <li>Identify the sources of manmade products (e.g., plastics, metal, aluminum, fabrics, paper, cardboard).</li> </ul>	<p>A. Know that raw materials come from natural resources.</p> <ul style="list-style-type: none"> <li>Identify resources used to provide humans with energy, food, housing and water.</li> <li>Explain how plants and animals may be classified as natural resources.</li> <li>Compare means of growing or acquiring food.</li> <li>Identify fiber and other raw materials used in clothing and shelter production.</li> <li>Identify types of minerals and fossil fuels used by humans.</li> </ul> <p>B. Examine the renewability of resources.</p> <ul style="list-style-type: none"> <li>Identify renewable resources and describe their uses.</li> <li>Identify nonrenewable resources and describe their uses.</li> <li>Compare finished products to their original raw material.</li> <li>Identify the waste derived from the use of renewable and nonrenewable resources.</li> <li>Determine how consumption may impact the availability of resources.</li> <li>Compare the time spans of renewability for fossil fuels and</li> </ul>	<p>A. Explain that renewable and nonrenewable resources supply energy and materials.</p> <ul style="list-style-type: none"> <li>Identify alternative sources of energy.</li> <li>Identify and compare fuels used in industrial and agricultural societies.</li> <li>Compare and contrast the cycles of various natural resources.</li> <li>Explain food and fiber as renewable resources.</li> </ul> <p>B. Evaluate factors affecting availability of natural resources.</p> <ul style="list-style-type: none"> <li>Describe natural occurrences that may affect the natural resources.</li> <li>Analyze technologies that affect the use of our natural resources.</li> <li>Evaluate the effect of consumer desires on various natural resources.</li> </ul>	<p>A. Analyze the use of renewable and nonrenewable resources.</p> <ul style="list-style-type: none"> <li>Explain the effects on the environment and sustainability through the use of nonrenewable resources.</li> <li>Evaluate the advantages and disadvantages of reusing our natural resources.</li> </ul> <p>B. Analyze factors affecting the availability of renewable and nonrenewable resources.</p> <ul style="list-style-type: none"> <li>Evaluate the use of natural resources and offer approaches for using them while diminishing waste.</li> <li>Compare the economics of different areas based on the availability and accessibility of the natural resources.</li> </ul>
<p>C. Know that some natural resources have limited life spans.</p> <ul style="list-style-type: none"> <li>Identify renewable and nonrenewable resources used in the local community.</li> <li>Identify various means of conserving natural resources.</li> <li>Know that natural resources have varying life spans.</li> </ul> <p>D. Identify by-products and their use of natural resources.</p> <ul style="list-style-type: none"> <li>Understand the waste stream.</li> <li>Identify those items that can be recycled and those that can not.</li> <li>Identify use of reusable products.</li> <li>Identify the use of compost, landfills and incinerators.</li> </ul>	<p>alternative fuels.</p> <p>C. Explain natural resource distribution.</p> <ul style="list-style-type: none"> <li>Distinguish between readily available and less accessible resources.</li> <li>Identify the locations of different concentrations of fossil fuels and mineral resources.</li> <li>Analyze the effects of management practices on air, land and water in forestry, agriculture, fisheries, wildlife, mining and food and fiber production that is unique to different climates.</li> </ul> <p>D. Describe the role of recycling and waste management.</p> <ul style="list-style-type: none"> <li>Identify materials that can be recycled in the community.</li> <li>Explain the process of closing the loop in recycling.</li> <li>Compare the decomposition rates of different organic materials.</li> <li>Describe methods that could be used to reuse materials for new products.</li> <li>Evaluate the costs and benefits of disposable products.</li> </ul>	<p>C. Analyze how man-made systems have impacted the management and distribution of natural resources.</p> <ul style="list-style-type: none"> <li>Explain the complete cycle of a natural resource, from extraction to disposal, detailing its uses and effects on the environment.</li> <li>Analyze energy uses and energy conservation in different regions.</li> <li>Examine conservation practices in different countries.</li> <li>Analyze the costs and benefits of different man-made systems and how they use renewable and nonrenewable natural resources.</li> <li>Analyze the impact of information systems on management and distribution of natural resources.</li> </ul> <p>D. Explain different management alternatives involved in recycling and solid waste management.</p> <ul style="list-style-type: none"> <li>Analyze the manufacturing process (before, during and after) with consideration for resource recovery.</li> <li>Compare various methods dealing with solid waste (e.g., incineration, compost, land application).</li> <li>Differentiate between pre/post-consumer and raw materials.</li> <li>Illustrate how one natural resource can be managed through reduction, recycling, reuse or use.</li> </ul>	<p>C. Analyze factors that influence the availability of natural resources.</p> <ul style="list-style-type: none"> <li>Compare the use of natural resources in different countries.</li> <li>Determine how delivery systems influence the availability of resources at the local, regional and national level.</li> </ul> <p>D. Evaluate solid waste management practices.</p> <ul style="list-style-type: none"> <li>Examine and explain the path of a recyclable material from collection to waste, reuse or recycling identifying the market forces.</li> <li>Understand current regulations concerning recycling and solid waste.</li> <li>Research new technologies in the use, reuse or recycling of materials.</li> </ul>

4.3. Environmental Health			
4.3.4. GRADE 4	4.3.7. GRADE 7	4.3.10. GRADE 10	4.3.12. GRADE 12
<i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills needed to:</i>			
<p>A. Know that plants, animals and humans are dependent on air and water.</p> <ul style="list-style-type: none"> <li>Know that all living things need air and water to survive.</li> <li>Describe potentially dangerous pest controls used in the home.</li> <li>Identify things that cause sickness when put into the air, water or soil.</li> <li>Identify different areas where health can be affected by air, water or land pollution.</li> <li>Identify actions that can prevent or reduce waste pollution.</li> </ul> <p>B. Identify how human actions affect environmental health.</p> <ul style="list-style-type: none"> <li>Identify pollutants.</li> <li>Identify sources of pollution.</li> <li>Identify litter and its effect on the environment.</li> <li>Describe how people can reduce pollution.</li> </ul> <p>C. Understand that the elements of natural systems are interdependent.</p> <ul style="list-style-type: none"> <li>Identify some of the organisms that live together in an ecosystem.</li> <li>Understand that the components of a system all play a part in a healthy natural system.</li> <li>Identify the effects of a healthy environment on the ecosystem.</li> </ul>	<p>A. Identify environmental health issues.</p> <ul style="list-style-type: none"> <li>Identify various examples of long-term pollution and explain their effects on environmental health.</li> <li>Identify diseases that have been associated with poor environmental quality.</li> <li>Describe different types of pest controls and their effects on the environment.</li> <li>Identify alternative products that can be used in life to reduce pollution.</li> </ul> <p>B. Describe how human actions affect the health of the environment.</p> <ul style="list-style-type: none"> <li>Identify land use practices and their relation to environmental health.</li> <li>Explain how natural disasters affect environmental health.</li> </ul> <p>C. Explain biological diversity.</p> <ul style="list-style-type: none"> <li>Identify residential and industrial sources of pollution and their effects on environmental health.</li> <li>Explain the difference between point and nonpoint source pollution.</li> <li>Explain how nonpoint source pollution can affect the water supply and air quality.</li> <li>Explain how acid deposition can affect water, soil and air quality.</li> <li>Explain the relationship between resource use, reuse, recycling and environmental health.</li> <li>Explain the complex, interactive relationships among members of an ecosystem.</li> <li>Explain how diversity affects ecological integrity of the natural resources.</li> </ul>	<p>A. Describe environmental health issues.</p> <ul style="list-style-type: none"> <li>Identify the effects on human health of air, water and soil pollution and the possible economic costs to society.</li> <li>Describe how indoor pollution may affect human health (e.g., dust mites, fumes, cat dandruff).</li> <li>Explain the costs and benefits of cleaning up contaminants.</li> <li>Explain how common household cleaning products are manufactured and how to dispose of their by-products after use.</li> </ul> <p>B. Explain how multiple variables determine the effects of pollution on environmental health, natural processes and human practices.</p> <ul style="list-style-type: none"> <li>Explain how human practices affect the quality of the water and soil.</li> </ul> <p>C. Explain biological diversity as an indicator of a healthy environment.</p> <ul style="list-style-type: none"> <li>Identify evidence of natural events around the world and their effects on environmental health (e.g., Yellowstone National Park fires).</li> <li>Identify local and state environmental regulations and their impact on environmental health.</li> <li>Analyze data and explain how point source pollution can be detected and eliminated.</li> <li>Identify and explain ways of detecting pollution by using state-of-the-art technologies.</li> <li>Explain species diversity.</li> <li>Analyze the effects of species extinction on the health of an ecosystem.</li> </ul>	<p>A. Analyze the complexity of environmental health issues.</p> <ul style="list-style-type: none"> <li>Identify environmental health issues and explain how they have been addressed on a worldwide level.</li> <li>Analyze efforts to prevent, control and/or reduce pollution through cost and benefit analysis and risk management.</li> <li>Describe the impact of occupational exposures as they relate to environmental health issues.</li> <li>Identify invisible pollutants and explain their effects on human health.</li> <li>Explain the relationship between wind direction and velocity as it relates to dispersal and occurrence of pollutants.</li> <li>Explain the different disposal methods used for toxic and hazardous waste.</li> </ul> <p>B. Analyze the local, regional and national impacts of environmental health.</p> <ul style="list-style-type: none"> <li>Analyze the cost of natural disasters in both dollars and loss of natural habitat.</li> <li>Research and analyze the local, state and national laws that deal with point and nonpoint source pollution; evaluate the costs and benefits of these laws.</li> <li>Explain mitigation and its role in environmental health.</li> <li>Explain industry's initiatives to meet state and federal mandates on clean air and water.</li> <li>Describe the impacts of point and nonpoint source pollution on the Chesapeake Bay.</li> <li>Identify and evaluate the costs and benefits of laws regulating air and water quality and waste disposal.</li> </ul> <p>C. Analyze the need for a healthy environment.</p> <ul style="list-style-type: none"> <li>Research the relationship of some chronic diseases to an environmental pollutant.</li> <li>Explain how man-made systems may affect the environment.</li> </ul>

4.8. Humans and the Environment			
4.8.4. GRADE 4	4.8.7. GRADE 7	4.8.10. GRADE 10	4.8.12. GRADE 12
<i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills needed to:</i>			
<p>A. Identify the biological requirements of humans.</p> <ul style="list-style-type: none"> <li>Explain how a dynamically changing environment provides for sustainability of living systems.</li> <li>Identify several ways that people use natural resources.</li> </ul> <p>B. Know that environmental conditions influence where and how people live.</p> <ul style="list-style-type: none"> <li>Identify how regional natural resources influence what people use.</li> <li>Explain the influence of climate on how and where people live.</li> </ul>	<p>A. Describe how the development of civilization relates to the environment.</p> <ul style="list-style-type: none"> <li>Explain how people use natural resources in their environment.</li> <li>Locate and identify natural resources in different parts of the world.</li> <li>Compare and contrast how people use natural resources throughout the world.</li> </ul> <p>B. Explain how people use natural resources.</p> <ul style="list-style-type: none"> <li>Describe how natural resources are used for survival.</li> <li>Explain how natural resources and technological changes have affected the development of civilizations.</li> <li>Explain how climate and extreme weather events (e.g., drought, flood) influence people's lives.</li> </ul>	<p>A. Analyze how society's needs relate to the sustainability of natural resources.</p> <ul style="list-style-type: none"> <li>Explain why some societies have been unable to meet their natural resource needs.</li> <li>Compare and contrast the use of natural resources and the environmental conditions in several countries.</li> <li>Describe how uses of natural resources impact sustainability.</li> </ul> <p>B. Analyze the relationship between the use of natural resources and sustaining our society.</p> <ul style="list-style-type: none"> <li>Explain the role of natural resources in sustaining society.</li> <li>Analyze the effects of a natural resource's availability on a community or region.</li> </ul>	<p>A. Explain how technology has influenced the sustainability of natural resources over time.</p> <ul style="list-style-type: none"> <li>Describe how technology has changed the use of natural resources by business and industry.</li> <li>Analyze the effect of natural resource conservation on a product over time (e.g., automobile manufacturing, aluminum can recycling, paper products).</li> </ul> <p>B. Analyze technology's role on natural resource sustainability.</p> <ul style="list-style-type: none"> <li>Explain how technology has decreased the use of raw natural resources.</li> <li>Explain how technology has impacted the efficiency of the use of natural resources.</li> <li>Analyze the role of technology in the reduction of pollution.</li> </ul>

4.9. Environmental Laws and Regulations			
4.9.4. GRADE 4	4.9.7. GRADE 7	4.9.10. GRADE 10	4.9.12. GRADE 12
<i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills needed to:</i>			
<p>A. Know that there are laws and regulations for the environment.</p> <ul style="list-style-type: none"> <li>Identify local and state laws and regulations regarding the environment.</li> <li>Explain how the recycling law impacts the school and home.</li> <li>Identify and describe the role of a local or state agency that deals with environmental laws and regulations.</li> </ul>	<p>A. Explain the role of environmental laws and regulations.</p> <ul style="list-style-type: none"> <li>Identify and explain environmental laws and regulations (e.g., Clean Air Act, Clean Water Act, Recycling and Waste Reduction Act, Act 26 on Agricultural Education).</li> <li>Explain the role of local and state agencies in enforcing environmental laws and regulations (e.g., Department of Environmental Protection, Department of Agriculture, Game Commission).</li> </ul>	<p>A. Explain why environmental laws and regulations are developed and enacted.</p> <ul style="list-style-type: none"> <li>Explain the positive and negative impacts associated with passing environmental laws and regulations.</li> <li>Understand conflicting rights of property owners and environmental laws and regulations.</li> <li>Analyze the roles that local, state and federal governments play in the development and enforcement of environmental laws.</li> <li>Identify local and state environmental regulations and their impact on environmental health.</li> <li>Explain the positive and negative impacts of the Endangered Species Act.</li> </ul>	<p>A. Analyze environmental laws and regulations as they relate to environmental issues.</p> <ul style="list-style-type: none"> <li>Analyze and explain how issues lead to environmental law or regulation (e.g., underground storage tanks, regulation of water discharges, hazardous, solid and liquid industrial waste, endangered species).</li> <li>Compare and contrast environmental laws and regulations that may have a positive or negative impact on the environment and the economy.</li> <li>Research and describe the effects of an environmental law or regulation and how it has impacted the environment.</li> </ul>

## Appendix B – Teacher Resources

### **Sample Lesson Plans and Units of Study**

#### **PBS “Garbage Dreams”**

A middle and high school aged recycling themed unit that takes a look at Egypt’s 80% recycling rate. This unit includes lesson plans, a link to the documentary “Garbage Dreams,” and a link to the Garbage Dreams Game. The film, the game, and the corresponding lesson plans explore recycling and the globalized economy.

“Four standards-aligned lesson plans encourage students to learn more about recycling practices in their own communities and around the world”

<http://www.pbs.org/independentlens/garbage-dreams/classroom.html>

[http://www.pbs.org/independentlens/garbage-dreams/classroom/04\\_garbage dreams\\_lesson.pdf](http://www.pbs.org/independentlens/garbage-dreams/classroom/04_garbage dreams_lesson.pdf)

#### **Department of Environmental Protection**

8 lesson plans that illustrate a variety of recycling concepts for grades Kindergarten through 12.

[http://www.dep.state.pa.us/dep/deputate/enved/rec\\_lessons/contents.htm](http://www.dep.state.pa.us/dep/deputate/enved/rec_lessons/contents.htm)

#### **EPA’s Recycling City**

This is an interactive website for students.

“Explore Recycle City to see how the people of the town reduce waste, use less energy, and even save money by doing simple things at home, at work, and in their neighborhoods.”

<http://www.epa.gov/recyclecity/>

#### **Teacher’s Guide**

This site provides a variety of recycling lesson plans, recycling thematic units and recycling activities for teachers.

<http://www.theteachersguide.com/Recyclinglessonplans.htm>

#### **Recycle Works**

A 6<sup>th</sup> grade science and technology lesson that encourages students to take a closer look at waste.

Students are encouraged to learn more about what is done with trash and what impact trash has on the environment. Students gather information in order to be able to form their own opinion on what should be done to deal with the waste problem.

[http://www.recycleworks.org/schools/6thgrade\\_lesson.html](http://www.recycleworks.org/schools/6thgrade_lesson.html)

#### **The Green Squad**

An interactive site for students who want to learn how they can “green” their schools

[http://www.nrdc.org/greensquad/intro/intro\\_1.asp](http://www.nrdc.org/greensquad/intro/intro_1.asp)

#### **Paper Recycling**

Information and activities for students about recycling paper in schools

[http://www.paperrecycles.org/school\\_recycling/index.html](http://www.paperrecycles.org/school_recycling/index.html)

## Appendix C – Additional Resources

### **Sample Activity Sheets**

These links have samples of activity and coloring books that educate students about the importance of recycling.

<http://dswa.org/index.php/recycling/target-recycling/recycling-ben-program>

South Carolina Department of Health and Environmental Control  
Recycling Coloring Booklet

[http://www.scdhec.gov/environment/lwm/recycle/pubs/you\\_color\\_cb.pdf](http://www.scdhec.gov/environment/lwm/recycle/pubs/you_color_cb.pdf)

Activity Booklet

<http://www.scdhec.gov/administration/library/OR-0226.pdf>

### **Making Recycling Signs**

These sites offer help with creating recycling signs that can then be printed and attached to recycling containers.

Students can make recycling signs for papers bins (customizable depending on the paper being recycled)

[http://www.paperrecycles.org/workplace\\_recycling/dynamicposter/index.html](http://www.paperrecycles.org/workplace_recycling/dynamicposter/index.html)

Signs for all types of bins (Recycling, Compost, Landfill)

<http://schools.stopwaste.org/signage/downloadable-bin-labels.html>

### **Recycling Poster Competition**

Students in Dalton, Georgia design a billboard keeping with the spirit of America Recycles Day.

<http://dswa.org/index.php/recycling/target-recycling/school-recycling>

## Appendix D – Waste Minimization Resources

### **Waste Minimization Resources**

This California website provides guidance and resources (lesson plans, activities, tips, information, etc.) for schools looking to reduce waste and educate students about waste reduction.

<http://schools.stopwaste.org/>