



Environmental Heritage Time Line- This version emphasizes the state of the environment and its protection/awareness. Events are listed by decade for brevity—refer to the complete timeline on our website for more exact dates.

Environmental Progress In Action!

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The Department of Environmental Protection is pleased to offer this poster as an educational tool for focusing on Pennsylvania's environmental heritage and progress. The poster also highlights trends in environmental protection to the 21st century at a level that is appropriate for middle school students.

People often have the mistaken belief that in colonial times the environment was pristine -- that the early colonists were kinder to the environment than current commonwealth citizens living in a technologically advanced age. The truth of the matter is that the average colonists were more likely to be concerned with their survival and establishing a functioning society in a wilderness than in understanding and protecting the natural environment. Pennsylvania's, once almost unbroken, forest cover was changed forever due to early clearing for farming and settlements, timbering and mining. Even Native Americans often relocated their settlements when the resources of their immediate surroundings were depleted.

This general lack of concern and/or understanding for the environment and for natural resources led to such legacies as towns developing on flood plains and large scale losses of top soil during early farming efforts. As population densities grew, the problems resulting from this lack of knowledge became more and more apparent -- problems such as drinking water contaminated by human waste and species extinction due to habitat loss and unregulated hunting. The industrial revolution and the growth of technology led to additional environmental pressures and problems. The early colonists weren't necessarily better, environmentally, than today's citizens -- there were just fewer people, life was more technologically simple, and folks worked with different tools.

A study of Pennsylvania's environmental heritage reveals that it takes two, sometimes extraordinary, factors to improve and protect the environment. These two factors coupled with the slow, steady advance of science and the incorporation of scientific advances into everyday practice result in environmental progress.

One factor is often an environmental leader with a vision and the resources to bring that vision to fruition. The second factor is a disaster, or at least an unhappy circumstance, compelling enough to inspire citizens to strive for improvement in a particular environmental area. This type of effort is usually accomplished through legislation.

A review of Pennsylvania's environmental heritage affords the opportunity to study the two factors mentioned above -- environmental leaders driving environmental progress in astounding ways and disasters resulting in legislation and regulation -- a reflection of citizens in action. The time line on the front of the poster is a very brief summary of our state's environmental heritage. For a more detailed look at this heritage, visit DEP's website at www.depweb.state.pa.us. Click on "DEP Keywords" and enter the word "Heritage" in the "Keyword Locator" text box.

The slow but steady growth of society's body of scientific knowledge results in something known as Best Management Practices or BMPs. These practices might be defined as the current best way to do business. BMPs really exist in all areas, but as an example let's focus on mining. In the early days of mining, there were no BMPs -- people just mined. This lack of BMPs resulted in much environmental damage -- damage that we are still striving to correct today. Today, you don't just mine. There is a permitting process that a mining company must go through to demonstrate that mining BMPs are in place at the design stage to protect the environment before the mining begins. There are BMPs for farming, logging, construction and more. Some BMPs are mandated while others are voluntary. BMPs grow from the advance of science -- science that catches the eye of agencies, industries and citizens and which is felt to be economically reasonable.

Learning from the progression of scientific information comes slowly. The Pennsylvania Dutch farmers were among the first to use conservation practices - to improve depleted soil. Hundreds of deaths a year from yellow fever and other diseases led to treating wastewater and drinking water. Streams choked with soil and coal dust washed from hillsides where the forest had been clear cut and where minerals had been mined -- resulted in new, scientific forest management practices and mining controls.

Environmental leaders and BMPs, then, led environmental progress. How is environmental progress measured? One way to measure environmental progress is to look for indicators -- signs of conditions that indicate environmental health and possible improvement. Living indicators are called bioindicators. A housing subdivision, which locates new homes close together while preserving open space on the tract, is an indicator of land use BMPs. Mayflies, an aquatic insect very sensitive to pollution, are bioindicators. Environmental literacy for today requires a working knowledge of BMPs and environmental indicators. Today we can learn from the patterns of the past and using indicators, get away from the pattern of letting disaster happen and then taking steps to solve the problem. We can now prevent problems before they start -- something no other generation in Pennsylvania's history has had the opportunity to do.

The two following activities assist elementary and middle school students and their teachers in using this poster to learn more about Pennsylvania's environmental heritage, BMPs, and environmental indicators -- a look at where we have been and where we are going, as we move forward into the new century. By completing these activities, students will get a first hand look at "Environmental Progress in Action!"

Looking Back...It Helps Us Move Forward!

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| Subjects: | Environmental Education, Social Studies, Language Arts |
| Concepts: | 1. A study of Pennsylvania's environmental heritage reveals patterns. 2. Social and environmental events work together to drive environmental progress. |
| Skills: | Reading, Discussing, Critical thinking |
| Pa. EE Standards: | Assists in meeting proposed Pa. Dept. of Education Academic Standards for Environment and Ecology 4.3.7(A) (B), 4.8.7 (B) and 4.9.7(A) |
| Materials: | A copy of DEP's poster "Environmental Progress in Action." Additional copies of the poster are available by calling DEP's Environmental Education and Information Center (717) 772-1828 while supplies last. |
| Preparation Time: | 20 minutes |
| Class Time: | 45 minutes |

Background/Teacher Preparation

Read the front of the poster, particularly the historical time line, the information above and the action steps below.

Action

1. Hold up the poster and point out the environmental heritage time line around the outside of the poster. Have each student read the text of the time line.
2. Divide the students into groups of four to work as teams. Have each team choose an environmental leader named on the time line. Require different groups to pick a different leader. Have each team discuss what they feel is their leader's reason for being on the time line and why this contribution was important. Students should put this importance into their own words.
3. Briefly share what each team decided.
4. Ask your students to discuss what the relationship is between environmental disaster and government regulations. Students may have to review the time line between 1870 and 1970. Illustrate this relationship with one example from the time line. Why do you think that this relationship developed? What would be better than this relationship to accomplish environmental progress?
5. Discuss the ideas offered by the different teams concerning this last question on a better way to accomplish environmental progress.
6. Can your students identify a point on the time line when environmental progress started to move forward at a faster pace than in the past? (About 1970) Ask the students why this increase in pace may have occurred.
7. Did any of the events on the time line happen locally or regionally to your school, or do you see any local effects of any of the major events and their results?

Extension

Have the students choose leaders or events, then research and report on either in more detail. Visit DEP's website and study the entire time line to learn more (www.dep.state.pa.us, click on "DEP Keywords" and enter the word "Heritage" in the "Keyword Locator" text box.) Electronically mail what your class feels is the best answer discussed in number 5 above to ra-elearningcenter@pa.gov. You will receive a response!

Pennsylvania's Environmental Leaders

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| Grade Level: | 4th Grade |
| Subjects: | Environmental Education, Social Studies and Language Arts |
| Concepts: | 1. Pennsylvania's environmental heritage and progress have been greatly influenced by certain individuals. 2. Studying environmental leaders and their contributions is a way to follow environmental progress. |
| Skills: | Comprehending, concept forming, discussing, determining cause and effect, identifying relationships and patterns, elaborating |
| Pa. EE Standards: | Humans and the Environment 4.8.4(c). |
| Materials: | One or two sets of Pennsylvania Environmental Heritage Trading Cards. Phone Pa. DEP's Environmental Education and Information Center number (717) 772-1828 while supplies lasts. Acetate sheets, overhead projector or computer and LCD projector. |
| Preparation Time: | 15 minutes |
| Class Time: | 1.5 hours |
| Teacher Preparation: | Scan photo side of the trading cards, or make overhead transparencies of the photo side of the trading cards. Use the lightest setting on your copying machine. You can fit nine cards onto one 8.5" by 11" sheet of acetate, or you can make individual transparencies of each card. |

Action:

1. Explain to your students that you have trading cards. The trading cards show real people who lived or worked in Pennsylvania and who made a difference in Pennsylvania's environment. Ask the students what is meant by "the environment" to review what they associate with the term. Although the children may offer rainforests, oceans, whales and other animals such as tigers, continue eliciting responses until characteristics of your local and regional environment are offered (the plants in the school yard, the trees along the street, the air we breathe, the water that comes out of the faucet, the little streams that flow through their neighborhoods, our roads and buildings, etc.)

Ask the students if there is anything that they can do to help the environment. You may wish to link this question to Earth Day (April 22) events in your school or community if the timing is appropriate. Simple things that the children might offer are saving water through simple conservation steps like turning off the water while they brush their teeth, not littering, planting a tree, recycling their water bottles, etc. Confirm that these actions are important to helping the environment.
2. Give each child one card and ask them to spend a few minutes looking at their cards. Tell them that the person's name appears just below the picture and that the back of the card explains when the person lived, where in Pennsylvania they lived or worked, what their job (VOCATION) was and what they did for the environment. Ask them to think about these questions:
 - a. Does their card show a man or a woman?
 - b. Does their card show a person who looks like he or she could be their neighbor? Why or why not?
 - c. Can you imagine what this person looked like when they were your age?
 - d. Can you pronounce your person's name?
 - e. Have you heard of the Pennsylvania town where this person lived or worked?
 - f. Can you read what your person did for the environment (ACCOMPLISHMENT)?
3. One by one show the pictures of the people on the trading cards that you made for the overhead projector. Ask who in the room got the card -- one or two students may have gotten each one, depending on your class size. Have the recipient(s) of the picture of the moment stand up. Ask them which of the questions (a-f above) they could answer. Get them to share their thoughts and help them to read the information on the card while the rest of the class listens. Ask the entire class why each accomplishment was/is important. How was the environment made better by what each person did? If going through all 18 cards is too much for one time, you can do a few cards during a daily set aside time until they are all done.
4. To summarize when all the cards have been discussed, ask the class to imagine that all the people on the trading cards are their age. (About nine years old). What do you think these children were like? (Perhaps they appreciated the out-of-doors and spent much time there, perhaps they really liked science and math, perhaps they loved birds, etc.). Help the children to realize the importance of finding something they enjoy doing, learning and then doing what they are able. There is no telling where this may lead them!

Extension: Have each child or team of two children visit the library or the Internet and read about the person on their trading card and give a short report. More information is available on Pa. DEP's website at www.dep.state.pa.us. Click on "DEP Keywords" and enter the word "Heritage" in the "Keyword Locator" text box. This information is not written on a fourth grade level, however.

Assessment:

For student portfolios, have each child write this sentence across the bottom of a plain sheet of paper: "How one person can make a difference to the environment." Have them illustrate how this might happen.

For Younger Children:

Become familiar with the people and information on each trading card. Copy and cut out the photo side of each card. Laminate each trading card. Use the cards to play a standard game of concentration¹, reviewing the information after each game.

¹All cards are placed face down in random order. Children take turns turning two cards over and trying for two cards that match. All participants must have a clear view of the playing area. If there is no match, the player returns the cards to the face down position. Play passes to the next child if a match is unsuccessful. Children who obtain a match remove the two cards from the playing area and take another turn. The child with the most cards wins!

For more information, visit DEP's Web site at www.dep.state.pa.us, Keyword: "Environmental Education."