



**NONFORMAL ENVIRONMENTAL EDUCATION PROGRAMS:
GUIDELINES FOR EXCELLENCE**

The North American Association for Environmental Education

The North American Association for Environmental Education (NAAEE) is a network of professionals, students, and volunteers working in the field of environmental education throughout North America and in over 55 countries around the world.

NAAEE combines the perspectives of the environmental and educational communities, taking a cooperative, non-confrontational, scientifically balanced approach to promoting life-long learning about environmental issues.

NAAEE members think about how people become literate concerning environmental issues and believe education must go beyond consciousness-raising about these issues. It must prepare people to think together about the difficult decisions they have to make concerning environmental stewardship, and to work together to improve, and try to solve, environmental problems.

NAAEE recognizes the need for a coherent body of information about environmental issues. Its members also recognize that information and analysis are only part of an effective education program. To be truly effective, this body of knowledge must be integrated into all aspects of the curriculum and into all types of educating institutions for the widest array of audiences.

In order to provide support for environmental education and its practitioners, NAAEE offers a variety of professional products, events, and services. These include the NAAEE Annual Conference, printed and electronic publications, Internet-based resources, and representation among leading organizations within the educational and environmental communities.

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NONFORMAL ENVIRONMENTAL EDUCATION PROGRAMS: GUIDELINES FOR EXCELLENCE



North American Association
for Environmental Education

This book represents another in a series of documents published by NAAEE as part of the National Project for Excellence in Environmental Education. For more information on the National Project for Excellence in Environmental Education, visit: www.naaee.org/npeee.

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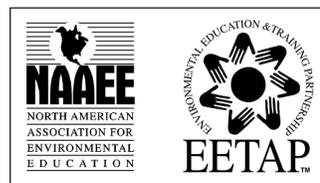


TABLE OF CONTENTS

Introduction.....	1
How to Use These Guidelines	1
How Were the Guidelines Developed?.....	2
A Step-by-Step Guide to the Flow of Program Development.....	3
How Do These Guidelines Link to Other Guidelines in This Series?.....	4
Why Environmental Education?.....	4
The Roots of Environmental Education	5
 Summary of <i>Nonformal Environmental Education Programs: Guidelines for Excellence</i>	 6
 Key Characteristic #1 NEEDS ASSESSMENT.....	 7
 Key Characteristic #2 ORGANIZATIONAL NEEDS AND CAPACITIES.....	 10
 Key Characteristic #3 PROGRAM SCOPE AND STRUCTURE	 12
 Key Characteristic #4 PROGRAM DELIVERY RESOURCES	 16
 Key Characteristic #5 PROGRAM QUALITY AND APPROPRIATENESS	 19
 Key Characteristic #6 EVALUATION.....	 23
 Appendices.....	 27
A: Writing SMART Objectives	28
B: Using Rubrics	29
C: Working with Adult Learners.....	30
D: What You Need to Know About Children Under Six.....	31
E: Logic Models as a Tool for Program Development and Evaluation.....	32
 Selected References.....	 33
 Glossary of Key Terms	 35

INTRODUCTION

The ultimate goal of environmental education is the development of an environmentally literate citizenry. Environmentally literate individuals understand environmental issues and how environmental quality is impacted by human decisions. In addition, they use this knowledge to make informed, well-reasoned choices that also take social and political considerations into account.

Nonformal Environmental Education Programs: Guidelines for Excellence comprises a set of recommendations for developing and administering high quality nonformal environmental education programs. These recommendations provide a tool that can be used to ensure a firm foundation for new programs or to trigger improvements in existing ones. The overall goal of these guidelines is to facilitate a superior educational process leading to the environmental quality that people desire. This overall goal is shared with the other guidelines produced by the North American Association for Environmental Education's National Project for Excellence in Environmental Education.

The term "environmental education program" is used in these guidelines to mean an integrated sequence of planned educational experiences and materials intended to reach a particular set of objectives. Programs, taken together, are the methods by which an organization's education goals are accomplished. Programs can be small or large and can range from short-term, one-time events to long-term, community capacity-building efforts.

Nonformal environmental education programs can be extremely diverse in their settings and in their target audiences. Community-based groups, service organizations, government agencies, boys and girls clubs, Elderhostels, parks and

reserves, state and national forests, residential centers, nature centers, zoos, museums, 4-H clubs, scouting organizations, etc., all may be involved in nonformal environmental education. (See the glossary for definitions of terms such as "environmental justice," "environmental social marketing," "informal environmental education," and "environmental interpretation," which are often considered to be part of or related to "nonformal environmental education.")

HOW TO USE THESE GUIDELINES

Nonformal Environmental Education Programs: Guidelines for Excellence points out six key characteristics of high quality nonformal environmental education programs. For each characteristic, guidelines are listed for nonformal program developers or educators to consider. Finally, each guideline is accompanied by several indicators listed under the heading, "**What to look for:**" These indicators are simply clusters of attributes you might look for to help gauge whether the characteristic is embodied in the nonformal program you are reviewing or developing.

Nonformal Environmental Education Programs: Guidelines for Excellence can help the educator, administrator, or program developer who is concerned about the quality of nonformal environmental education programs. It provides direction while allowing flexibility in shaping content, technique, and other aspects of program delivery. These guidelines offer a way of judging the relative merit of different programs, a standard to aim for in developing new programs, and a set of ideas about what a well-rounded nonformal environmental education program might be like.

It is not reasonable to expect that every nonformal environmental education program will follow all of the guidelines. For example, a nonformal program might not have a structured evaluation plan in place. This shortcoming does not necessarily mean that the program is fatally flawed. In cases such as this one, *Nonformal Environmental Education Programs: Guidelines for Excellence* can point out areas for improvement.

Similarly, it is likely that specific indicators for one or more of the key characteristics may not apply to a particular program. For instance, planners for a series of evening community forums would likely not have to concern themselves with the indicator that states, “The program’s goals and objectives ... are consistent with applicable national, state, and local educational goals and objectives.” Users of these *Guidelines* will need to determine which key characteristics, guidelines, and indicators are relevant in their particular situation. (See table entitled “A Step-by-Step Guide to the Flow of Program Development” on the next page.)

No set of guidelines could contain every possible detail of what constitutes a quality program. However, *Nonformal Environmental Education Programs: Guidelines for Excellence* provides a foundation on which to build programs that work. As a tool to inform judgment, these *Guidelines* can contribute to more effective environmental education.

HOW WERE THE GUIDELINES DEVELOPED?

In an effort to assure that *Nonformal Environmental Education Programs: Guidelines for Excellence* reflects a widely shared understanding of environmental education, a writing team comprised of environmental education professionals from a variety of backgrounds and organizational affiliations developed the document. This team took on the challenge of turning ideas about quality into usable guidelines. In addition, drafts of these guidelines were circulated widely to practitioners and scholars in the field (e.g., zoo and museum educators, community educators, administrators, environmental scientists, and youth leaders), and their comments were incorporated into successive revisions of the document.

Sample format for the guidelines:

KEY CHARACTERISTIC #1: _____

Description of Key Characteristic

1.1) Guideline
What to look for:

- Indicator
- Indicator

1.2) Guideline
What to look for:

- Indicator
- Indicator

A Step-by-Step Guide to the Flow of Program Development

STEPS START HERE ↓		SPECIFIC ACTIONS
1. Needs assessment. (What needs will the program meet?)	←	Identify environmental issue(s) to be addressed. Inventory existing programs. Seek input from community and potential audience(s).
↓		
2. Assessment of organizational needs and capacities. (How will the program support the parent organization's goals?)	←	Consider goals and priorities of parent organization. Identify parent organization's need for the program. Determine resources and capacities of parent organization.
↓		
3. Determination of the program scope and structure. (How is the program structured and what does it hope to accomplish?)	←	Develop program goals and objectives. Assess overall fit with field of EE. Determine format, techniques, and training needs. Explore potential for partnerships.
↓		
4. Program delivery resources. (Are instructional staff members fully prepared to deliver the program? Are needed supplies, materials, and facilities ready and available?)	←	Assess logistical and resource needs. Assess staff competencies and training needs. Arrange needed facilities, supplies, and equipment.
↓		
5. Program quality and appropriateness. (Are instructional materials educationally sound?)	←	Obtain or develop educationally sound materials. Field test new instructional materials. Market program. Develop sustainability strategies.
↓		
6. Evaluation. (Has an evaluation strategy been developed and implemented?)	←	Develop evaluation strategies, techniques, and criteria. Implement practical program evaluation and use results.
↓		
FINISH / START AGAIN		

HOW DO THESE GUIDELINES LINK TO OTHER GUIDELINES IN THIS SERIES?

Nonformal Environmental Education Programs: Guidelines for Excellence is one in an ongoing series of guidelines being developed as part of NAAEE's National Project for Excellence in Environmental Education. Taken together, the comprehensive set of guidelines constitutes a collection of tools that can provide practitioners with a firm grounding in the theory and practice of environmental education and can help elevate their work to the highest level of quality. (To learn more about the National Project for Excellence in Environmental Education and the guidelines, visit www.naaee.org/npeee.)

Each resource in the series has been developed to respond to specific needs that the environmental education community identified. As with this publication, each resource in the series was developed with an intensive research-based and peer-review process. Particularly relevant *Guidelines* documents are detailed below, and the entire series is described inside the back cover of this publication.

Nonformal Environmental Education Programs: Guidelines for Excellence is designed to integrate synergistically with other publications in the *Guidelines* series:

Excellence in Environmental Education: Guidelines for Learning (K-12) details the understandings and skills needed for students' environmental literacy;

Environmental Education Materials: Guidelines for Excellence provides criteria for the selection or development of quality environmental education instructional materials; and,

Guidelines for the Preparation and Professional Development of Environmental Educators specifies the competencies that instructors need in order to use educational materials and other

resources to successfully teach towards the goal of environmental literacy.

Nonformal Environmental Education Programs: Guidelines for Excellence builds on the other *Guidelines* publications. It delineates ways to think about programmatic structure, goals and objectives, and logistical considerations to help environmental educators develop and implement effective programs that promote environmental literacy.

WHY ENVIRONMENTAL EDUCATION?

For many, environmental education is rooted in the belief that humans can live compatibly with nature and act equitably toward each other. Another fundamental belief is that people can make informed decisions that consider future generations. Environmental education aims for an effective, environmentally literate citizenry able to participate with creativity and responsibility in a democratic society.

Environmental education often begins close to home, encouraging learners to understand and forge connections with their immediate surroundings. The environmental awareness, knowledge, and skills needed for this localized learning provide a basis for moving out into larger systems, broader issues, and a more sophisticated comprehension of causes, connections, and consequences.

Whether working with adults or children, environmental education is learner-centered and provides participants with opportunities to construct their own understanding through hands-on, minds-on investigations. Engaged in direct experiences, learners are challenged to use higher order thinking skills. Environmental education provides real-world contexts and issues from which concepts and skills can be learned.

THE ROOTS OF ENVIRONMENTAL EDUCATION

The Belgrade Charter was adopted by a United Nations conference in 1976 and provides a widely accepted goal statement for environmental education: “The goal of environmental education is to develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations, and commitment to work individually and collectively toward the solutions of current problems and the prevention of new ones.”

A few years later, the world’s first intergovernmental conference on environmental education adopted the Tbilisi Declaration. This declaration built on the Belgrade Charter and established three broad goals for environmental education. These goals, which follow, provide the foundation for much of what has been done in the field since 1978:

- To foster clear awareness of, and concern about, economic, social, political, and ecological interdependence in urban and rural areas;
- To provide every person with opportunities to acquire the knowledge, values, attitudes, commitment, and skills needed to protect and improve the environment;
- To create new patterns of behavior of individuals, groups, and society as a whole towards the environment.

As the field has evolved, these goals have been researched, critiqued, revisited, and expanded. They still stand as a strong foundation for an internationally shared view of the core concepts and skills that environmentally literate citizens need. Since 1978, bodies such as the Brundtland Commission (Brundtland, 1987), the United Nations Conference on Environment and Development in Rio (UNCED, 1992), the International Conference on Environment and Society in Thessaloniki (UNESCO, 1997) and the 2002 World Summit on Sustainable Development in Johannesburg have influenced the work of many environmental educators. By highlighting the importance of viewing the environment within the context of human influences, these perspectives have expanded the emphasis of environmental education to focus more attention on social equity, economics, culture, and political structure.

Summary of *Nonformal Environmental Education Programs:* *Guidelines for Excellence*

Key Characteristic #1 – Needs Assessment.

Nonformal environmental education programs are designed to address identified environmental, educational, and community needs and to produce responsive, responsible benefits that address those identified needs.

- 1.1 Environmental issue or condition;
- 1.2 Inventory of existing programs and materials; and
- 1.3 Audience needs.

Key Characteristic #2 – Organizational Needs and Capacities.

Nonformal environmental education programs support and complement their parent organization's mission, purpose, and goals.

- 2.1 Consistent with organizational priorities;
- 2.2 Organization's need for the program identified; and
- 2.3 Organization's existing resources inventoried.

Key Characteristic #3 – Program Scope and Structure.

Nonformal environmental education programs should be designed with well-articulated goals and objectives that state how the program will contribute to the development of environmental literacy.

- 3.1 Goals and objectives for the program;
- 3.2 Fit with goals and objectives of environmental education;
- 3.3 Program format and delivery; and
- 3.4 Partnerships and collaboration.

Key Characteristic #4 – Program Delivery Resources.

Nonformal environmental education programs require careful planning to ensure that well-trained staff, facilities, and support materials are available to accomplish program goals and objectives.

- 4.1 Assessment of resource needs;
- 4.2 Quality instructional staff;
- 4.3 Facilities management;
- 4.4 Provision of support materials; and
- 4.5 Emergency planning.

Key Characteristic #5 – Program Quality and Appropriateness.

Nonformal environmental education programs are built on a foundation of quality instructional materials and thorough planning.

- 5.1 Quality instructional materials and techniques;
- 5.2 Field testing;
- 5.3 Promotion, marketing, and dissemination; and
- 5.4 Sustainability.

Key Characteristic #6 – Evaluation.

Nonformal environmental education programs define and measure results in order to improve current programs, ensure accountability, and maximize the effects of future efforts.

- 6.1 Determination of evaluation strategies;
- 6.2 Effective evaluation techniques and criteria; and
- 6.3 Use of evaluation results.

KEY CHARACTERISTIC #1: NEEDS ASSESSMENT

Nonformal environmental education programs are designed to address identified environmental, educational, and community needs and to produce responsive, responsible benefits that address those identified needs.

1.1) Environmental Issue or Condition.

The environmental education program is designed to respond to carefully considered needs and issues.

What to look for:

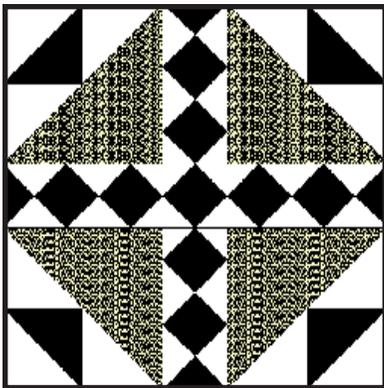
- The need for the program has been identified and confirmed cooperatively with stakeholders such as community residents, intended audiences, community leaders, etc.
- Specific environmental conditions or issues to be addressed by the program have been identified through the needs assessment.

1.2) Inventory of Existing Programs and Materials.

The environmental education program builds on existing resources and complements existing programs.

What to look for:

- An analysis has been conducted to confirm that the program does not duplicate existing efforts and is complementary to ongoing programs of other organizations. A survey of the literature, existing environmental education programs, potential partners, community residents, etc., has been conducted as part of this analysis.
- Community and organizational strengths and resources (human, environmental, material, and programmatic) have been inventoried to see if present resources can be adapted or adopted to fill the need.
- Community and organizational strengths and resources (human, environmental, material, and programmatic) that could contribute to the environmental education program have been identified, as well as gaps that might hinder the successful development of the program.



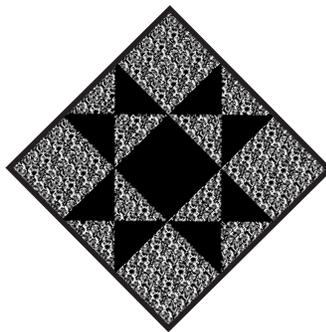
Windows on the Wild

World Wildlife Fund — Washington, D.C.

In 1993, World Wildlife Fund, with support from Eastman Kodak Company, launched a national environmental education program, *Windows on the Wild*, to increase environmental literacy using biodiversity as the organizing theme.

To assess educators' needs and help guide development of *Windows on the Wild*, WWF conducted a national education survey. Two national samples of educators were selected to assess interest in, status of, and perceived needs related to biodiversity education. Surveys were administered to a national sample of middle school science and social science teachers and to a national sample of educators from zoos, aquariums, nature/science centers, museums, and botanical gardens. A total of 2,081 teachers and 708 nonformal educators responded to the survey. The following key findings are taken from the survey results:

- The majority of middle school and nonformal educators agreed that biodiversity education should be established as a priority in their given institutions.
- The majority of teacher respondents expressed a need for teacher workshops related to biodiversity education.
- Both middle school and nonformal educators identified barriers that prevent them from conducting biodiversity education programs.
- The majority of teachers expressed a need for educational resources to help them incorporate biodiversity into their teaching programs.
- The majority of nonformal educators wanted assistance in developing and offering biodiversity education programs for schools.
- Both middle school and nonformal educators felt that, given appropriate resources, it would be beneficial for them to develop collaborative biodiversity education efforts.
- Environmental education is strongly supported as an important education initiative by both middle school and nonformal educators responding to this survey.



1.3) Audience Needs.

The environmental education program reflects a careful analysis and consideration of the target audience(s).

What to look for:

- The cultural perspectives, needs, and interests of the target audience (the precise segments of the population or community with which you will work) have been identified, understood, accommodated, and addressed in program development and activities.
- An assessment of target audience understandings and skills has been conducted, including consideration of such issues as literacy levels, languages spoken, etc.
- Appropriate educational methodologies are identified for the specific characteristics (age, experience, cultural background, and education background) of the target audience.
- The kind and duration of program that is most appropriate to reach and meet the needs of the audience has been identified.
- The interrelationship of audience needs and provider needs has been examined.
- The program seeks to be inclusive and promotes a multicultural experience. It is sensitive to the culture, ethnic background, and gender of the audience.
- Facilities and activities used are broadly accessible and comply with both the spirit and letter of the Americans with Disabilities Act.

Wonders in Nature - Wonders in Neighborhoods Denver Zoo — Denver, Colorado

The Wonders in Nature - Wonders in Neighborhoods (W.I.N.-W.I.N.) Program was developed and is co-managed by the Denver Zoo and the Colorado Division of Wildlife, but is truly a partnership of many organizations, people, and foundations. Instruction takes place at W.I.N.-W.I.N. partner schools or at outdoor learning sites provided by many of the program's 40 community partners. Currently the program services over 7,000 students in 19 urban, socio-economically diverse schools in the Denver metropolitan area.

To ensure accessibility to the target audience, W.I.N.-W.I.N. has reduced or eliminated many obstacles that often prevent urban children, families, and schools from taking advantage of the numerous environmental opportunities that abound in Colorado. For example, to make sure that W.I.N.-W.I.N. is affordable, all program components, including classroom material, in-class instruction, bus transportation, entry fees, and field site instruction, are currently provided at no cost to students or schools. To address the most common language barrier, all student pages, worksheets, and parent communications are available in English and Spanish. Furthermore, when possible and appropriate, schools are provided with bilingual instructors.

During the school year, each class participating in the W.I.N.-W.I.N. program receives four to seven classroom visits with lessons provided by a program educator. The content of each lesson correlates with Colorado state education standard requirements. These hands-on, interdisciplinary lessons include science resources not always available to the classroom teacher. Many lessons taught by W.I.N.-W.I.N. include student interaction with live animals and plants. After each lesson, students reflect on the day's activity by writing or drawing in their W.I.N.-W.I.N. journals.

*For more information about W.I.N.-W.I.N., go to:
<http://www.denverzoo.org/education/win.asp>*

KEY CHARACTERISTIC #2: ORGANIZATIONAL NEEDS AND CAPACITIES

Nonformal environmental education programs support and complement their parent organization's mission, purpose, and goals.

2.1) Consistent with Organizational Priorities.

The environmental education program is consistent with, and supportive of, parent organization priorities and objectives.

What to look for:

- The program is consistent with the parent organization's mission, goals, objectives, long-range plan, and any applicable mandates.
- Program staff and program materials articulate the relationships among the program and the parent organization's mission, goals, objectives, long-range plan, and any applicable mandates.
- The program supports organizational communication strategies and priorities.
- The program's budget is consistent with and fully integrated into the parent organization's overall budget.

Project WILD Long-range Plan Council for Environmental Education — Houston, TX

In 1995, the Council for Environmental Education prepared the current long-range plan for Project WILD. During development, CEE was particularly concerned that the final plan should be consistent with the missions of its "parent" organizations—the State Fish and Game agencies and other integral members of the WILD team working together to produce the WILD program. To help accomplish this, CEE included the following goal and objectives:

GOAL 4: Project WILD will demonstrate the relevancy and benefits of its programs to sponsors and partners.

Objective 1: A plan will be developed in cooperation with coordinators and directors of sponsoring state agencies to define Project WILD in the context of state agency goals on a state-by-state basis.

Steps:

- 1) Solicit state agency environmental/conservation education goals from state directors and coordinators.
- 2) Develop a model program and/or case studies that demonstrate the connections between Project WILD and the state agency goals.
- 3) Disseminate program and/or case studies.
- 4) Assist coordinators in developing Project WILD state plans that reflect state agency missions and goals.

*For more information about Project WILD, go to:
www.projectwild.org*

2.2) Organization's Need for the Program Identified.

The environmental education program fills an identified need within existing activities of the sponsoring organization.

What to look for:

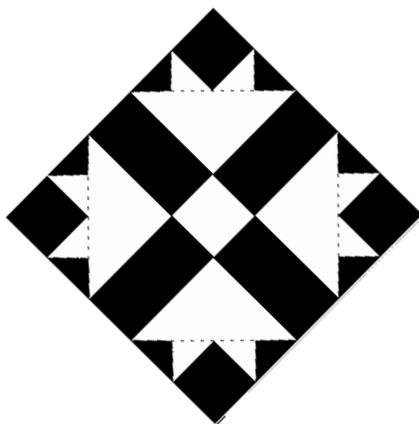
- Programs sponsored by the organization have been inventoried, the interrelationship of all programs considered, and the function of proposed new programs contrasted with existing activities.
- The role that any proposed new program plays in the overall offerings of the organization has been identified.

2.3) Organization's Existing Resources Inventoried.

The sponsoring organization has the means and will to support the program.

What to look for:

- The capacities and resources of the organization (human, financial, physical site, material resources, and supplies) have been inventoried and are sufficient to support the program successfully.
- Detailed consideration has been given to program resource needs over the long term.
- Organizational or agency leadership, including other departments and the Board of Directors, if applicable, support the program.
- Staff and volunteers to be involved in implementing the program support its development and implementation.



KEY CHARACTERISTIC #3: PROGRAM SCOPE AND STRUCTURE

Nonformal environmental education programs should be designed with well-articulated goals and objectives that state how the program will contribute to the development of environmental literacy.

3.1) Goals and Objectives for the Program.

The environmental education program is based on well-considered goals and objectives. (See also Appendix A: Writing SMART Objectives and Appendix B: Using Rubrics.)

What to look for:

- The environmental education program is based on clearly delineated, relevant goals and objectives related to the ultimate goal of an environmentally literate citizenry and environmental quality.

Canon Envirothon League City, Texas

The Canon Envirothon's mission is to develop knowledgeable, skilled, and dedicated citizens who are willing and prepared to work towards achieving and maintaining a natural balance between the quality of life and the quality of the environment. This mission is accomplished by developing in young people an understanding of the principles and practices of natural resource management and ecology, and through practice dealing with complex resource management decisions. The Canon Envirothon fosters a working partnership with resource professionals and the general public to promote goals of environmental education in grades 9-12 and to recognize students who achieve excellence in environmental and natural resource knowledge and skills. Below is an edited example of a program goal and its associated objectives.

Goal 2

To promote stewardship of natural resources and to encourage the development of the critical thinking, cooperative problem-solving, and decision-making skills required to achieve and maintain a natural balance between the quality of life and the quality of the environment.

Objectives:

- b. Students should be able to investigate issues using both primary and secondary sources of information and synthesize the data gathered. Students should demonstrate the ability to:
- Listen with comprehension;
 - Frame appropriate questions to guide their investigation;
 - Collect, organize, and analyze information;
 - Use a range of resources and technologies in addressing questions; and
 - Critically examine information from a variety of sources.

- d. Students should be able to identify alternative solutions for various issues and their associated value perspectives. They should be able to evaluate alternative solutions with respect to their ecological and cultural implications.

For more information about the Canon Envirothon, go to: www.envirothon.org

- Program goals and objectives
 - describe accurately and specifically what the program is designed to accomplish. Objectives are attainable and measurable.
 - reflect the value of long-term commitments by the organization and partners.
 - relate specifically to the needs and interests of the identified audience(s).
 - address any applicable standards or mandates of the organization.
 - consider relevant aspects of state or federal planning documents and, for school-focused youth programs, are consistent with applicable national, state, and local educational goals and objectives.
 - are consistent with the purposes for which the program was funded and responsive to intended uses specified by the funder.
- Partners develop program goals and objectives collaboratively.
- Program materials clearly explain the program’s importance.
- Topics to be included, major concepts to cover, and key questions to be considered by the program clearly follow from the goals and objectives.
- The tangible and intangible costs and benefits of reaching goals and objectives are considered as the goals and objectives are developed.
- Evaluation criteria and indicators of success are specified for the program and tied to program goals and objectives.

3.2) Fit with Goals and Objectives of Environmental Education.

The environmental education program builds towards the larger goals and objectives of the environmental education field.

What to look for:

- The program clearly establishes how it contributes to the larger goals of environmental literacy and responsible action such as those detailed in *Excellence in Environmental Education: Guidelines for Learning (K-12)*, published by the North American Association for Environmental Education. (See sidebar on next page.)
- The program considers how it contributes to a comprehensive environmental education program in the local area, state, and region, and includes applicable state plans as resources.

3.3) Program Format and Delivery.

The environmental education program is built on careful consideration of the program format and delivery system(s) that will most effectively reach the target audience.

What to look for:

- The “medium” or format (e.g., workshop, demonstration area, community forum, festival, course, guest speaker) is appropriate to meet the set goals and objectives, and thought has been given to the appropriate context needed to accomplish objectives. For instance, is it a stand-alone event or activity? Is it infused throughout other programs or curricula? Is it a module, activity, or event inserted into an existing program or part of a regular community group activity?
- The program’s scope and duration are appropriate to meet the goals and objectives.
- Program format and delivery mechanisms meet the needs of the intended audience.
- Program format and delivery are designed to provide a “safe” and comfortable atmosphere for audience members of all races, genders, ages, or cultures.

Summary of *Excellence in Environmental Education: Guidelines for Learning (K-12)*

These guidelines set a standard for high-quality environmental education across the country, based on what an environmentally literate person should know and be able to do. By setting expectations for performance and achievement in fourth, eighth, and twelfth grades, *Guidelines for Learning* suggests a framework for effective and comprehensive environmental education programs and curricula.

Strand #1 – Questioning, Analysis and Interpretation Skills

Environmental literacy depends on learners' ability to ask questions, speculate, and hypothesize about the world around them, seek information, and develop answers to their questions. Learners must be familiar with inquiry, master fundamental skills for gathering and organizing information, and interpret and synthesize information to develop and communicate explanations.

Strand #2 – Knowledge of Environmental Processes and Systems

An important component of environmental literacy is understanding the processes and systems that comprise the environment, including human systems and influences. That understanding is based on knowledge synthesized from across traditional disciplines. The guidelines in this section are grouped in four sub-categories:

- 2.1 The Earth as a physical system;
- 2.2 The living environment;
- 2.3 Humans and their societies; and
- 2.4 Environment and society.

Strand #3 – Skills for Understanding and Addressing Environmental Issues

Skills and knowledge are refined and applied in the context of environmental issues. These environmental issues are real-life dramas where differing viewpoints about environmental problems and their potential solutions are played out. Environmental literacy includes the abilities to define, learn about, evaluate, and act on environmental issues. In this section, the guidelines are grouped in two sub-categories:

- 3.1 Skills for analyzing and investigating environmental issues; and
- 3.2 Decision-making and citizenship skills.

Strand #4 – Personal and Civic Responsibility

Environmentally literate citizens are willing and able to act on their own conclusions about what should be done to ensure environmental quality. As learners develop and apply concepts and skills for inquiry, analysis, and action, they also understand that what they do individually and in groups can make a difference.

For more information on the Learner Guidelines, go to: <http://www.naaee.org/programs-and-initiatives/guidelines-for-excellence/materials-guidelines/learner-guidelines>

- The design of program format and delivery mechanisms includes a detailed consideration of how the program fits with a larger scope and sequence for environmental education and learner readiness for the concepts and skills presented.
- Evaluation strategies are designed and implemented to provide feedback to program partners and the audiences involved so that learning is not just unidirectional.

3.4) Partnerships and Collaboration.

The environmental education program maximizes effectiveness and efficiency by working in partnership with groups of similar interest or with shared goals.

What to look for:

- Potential partners and collaborators have been identified.
- The relationship of the program to desired long-term cooperative activities between and among partners is clearly articulated and understood.
- Partners have been involved in the process of developing the program.
- Roles of partners and collaborators are clearly established and are linked

- to the expertise, resources, and skills each partner brings.
- Duration of commitment to the program is clearly articulated among partners.
- The relationships among program goals and the goals of partners' programs and collaborators' interests are clear.
- A program development team represents partner and collaborator interests.

BirdCOR **Rochester, NY**

When BirdCOR, originally a program of Environmental Education and Conservation Global (EECG), but more recently a program of the Genesee Valley Audubon Society, was considering active participation in International Migratory Bird Day (IMBD) in 2003, one of the first things it did was to survey Rochester-area organizations and agencies involved in wildlife or habitat conservation. BirdCOR asked these groups if they felt that participation in IMBD activities would be beneficial to their organizations and to international migratory birds. They also asked if the groups would be willing to join a coalition of Rochester organizations and agencies, under the coordination of BirdCOR, to develop plans for a local celebration of International Migratory Bird Day.

Eventually, 14 groups responded and became part of the coalition. Approximately half of these organizations were active in coalition planning meetings for IMBD over an eight-month period. The others were kept informed and their opinions solicited by frequent emails and summaries of planning decisions. To ensure that the programs and activities developed were supportive of the overall goals of coalition members, the following two objectives were stated:

Objective: Strengthen coordination among organizations in the Rochester area engaged in migratory bird conservation and research.

Objective: Strengthen individual organizations in the coalition and enable them to better reach organizational objectives.

Steps—

Steps—

- Create a coordinating council to plan the migratory bird day activities and develop cooperative efforts in the local area to benefit migratory birds.
- Establish a successful record of cooperation through exemplary production of the migratory bird activities.

- Increased membership in organizations occurring immediately after IMBD in 2003.
- Increased inquiries and hits on organizations' web sites immediately after IMBD in 2003.
- Increased participation in organizations' field trips and meetings after IMBD in 2003.

The coalition decided to sponsor a festival on International Migratory Bird Day and planned educational programs and service projects focused on migratory birds leading up to the festival itself. On the day of the festival, coalition members presented educational programs and exhibits. Some 1500 people from the Rochester area visited the festival to learn more about migratory birds and their needs.

After the festival was completed, BirdCOR surveyed coalition members, asking a variety of questions, including how well the festival supported the goals of the organizations involved. BirdCOR also asked whether the process and content of the festival were seen as worthwhile, both from the standpoint of benefits to migratory birds and from the standpoint of benefits to the organizations. The responses to both questions were decidedly positive.

For more information about BirdCOR go to www.birdcor.org

KEY CHARACTERISTIC #4: PROGRAM DELIVERY RESOURCES

Nonformal environmental education programs require careful planning to ensure that well-trained staff, facilities, and support materials are available to accomplish program goals and objectives.

4.1) Assessment of Resource Needs.

The environmental education program has taken steps to ensure that staff, support materials, and facilities needed to conduct the program will be available.

What to look for:

- Resources needed to develop and implement the program have been clearly identified.
- Needed resources, both from within the organization and from its partners or clients, have been agreed to, and are available.

4.2) Quality Instructional Staff.

The planning and conducting of the environmental education program is based on a highly qualified and trained cadre of staff and volunteers.

What to look for:

- Background checks have been performed on prospective staff or volunteers, as appropriate.
- The competencies of program educators (staff or volunteers) have been assessed and it has been determined that they meet applicable competencies such as those outlined in NAAEE's *Guidelines for the Preparation and Professional Development of Environmental Educators*. (See sidebar on next page.)
- The training needs of staff, volunteers, and other presenters or educators have been assessed. Training extends beyond subject

matter and technique, and includes safety and emergency preparedness, handling of disruptive behavior, need for objectivity and balance, etc.

- If needed, a training program for staff, volunteers, and other presenters or educators has been designed and implemented.
- Professional development and enrichment activities are available for staff and volunteers.
- A performance review system to evaluate staff and volunteers is included as part of the organization's personnel policies and procedures. The review system is drawn from and supports specific program goals and objectives.

4.3) Facilities Management.

Safe and appropriate facilities are available for the environmental education program.

What to look for:

- Needed facilities have been reserved or rented.
- Facilities and areas to be used for the program have been surveyed to ensure that there are no medical or safety hazards.
- Needed permits and permissions have been obtained.
- Facilities and grounds meet the letter and spirit of the American's with Disabilities Act.

4.4) Provision of Support Materials.

Effective environmental education programs require that adequate supplies and resources be on hand.

What to look for:

- Equipment, supplies, refills, etc., have been obtained or ordered with sufficient time before the program is scheduled to begin.

Summary of Guidelines for the Preparation and Professional Development of Environmental Educators

Guidelines for the Preparation and Professional Development of Environmental Educators provides a set of recommendations about the basic knowledge and abilities educators need in order to provide high-quality environmental education. Instead of offering fixed rules, these guidelines suggest a broad vision — a goal to work toward and a guide for professional and programmatic development.

Theme #1 – Environmental Literacy

Educators must be competent in the skills and understandings outlined in *Excellence in Environmental Education: Guidelines for Learning (K-12)*.

- 1.1 Questioning and analysis skills;
- 1.2 Knowledge of environmental processes and systems;
- 1.3 Skills for understanding and addressing environmental issues; and
- 1.4 Personal and civic responsibility.

Theme #2 – Foundations of Environmental Education

Educators must have a basic understanding of the goals, theory, practice, and history of the field of environmental education.

- 2.1 Fundamental characteristics and goals of environmental education;
- 2.2 How environmental education is implemented; and
- 2.3 The evolution of the field.

Theme #3 – Professional Responsibilities of the Environmental Educator

Educators must understand and accept the responsibilities associated with practicing environmental education.

- 3.1 Exemplary environmental education practice;
- 3.2 Emphasis on education, not advocacy; and
- 3.3 Ongoing learning and professional development.

Theme #4 – Planning and Implementing Environmental Education Programs

Educators must combine the fundamentals of high-quality education with the unique features of environmental education to design and implement effective instruction.

- 4.1 Knowledge of learners;
- 4.2 Knowledge of instructional methodologies;
- 4.3 Planning for instruction;
- 4.4 Knowledge of environmental education materials and resources;
- 4.5 Technologies that assist learning;
- 4.6 Settings for instruction; and
- 4.7 Curriculum planning.

Theme #5 – Fostering Learning

Educators must enable learners to engage in open inquiry and investigation, especially when considering environmental issues that are controversial and require students to seriously reflect on their own and others' perspectives.

- 5.1 A climate for learning about and exploring the environment;
- 5.2 An inclusive and collaborative learning environment; and
- 5.3 Flexible and responsive instruction.

Theme #6 – Assessment and Evaluation

Environmental educators must possess the knowledge, abilities, and commitment to make assessment and evaluation integral to instruction and programs.

- 6.1 Learner outcomes;
- 6.2 Assessment that is part of instruction; and
- 6.3 Improving instruction.

For more information on the Preparation Guidelines, go to www.naaee.org/npeee

- Arrangements have been made for needed food, drinks, lodging, etc.
- Financial arrangements have been made to pay for food, entrance fees, supplies, etc., needed during the program and to collect applicable program charges.
- All equipment has been tested under conditions comparable to those likely during the program, and staff members are trained in its use and maintenance.

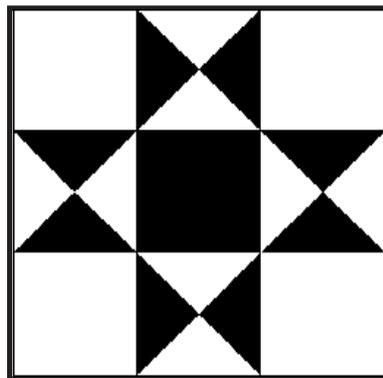
4.5) Emergency Planning.

A safe and effective environmental education program includes thorough emergency planning.

What to look for:

- Appropriate staff members have received training in first aid and cardiopulmonary resuscitation (CPR).

- Staff members
 - know whom to contact for medical assistance and to report an emergency such as a fire, and they know where the nearest phone or radio is to make the contact.
 - have been trained to recognize poisonous animals and plants and how to avoid them.
 - have been trained to respond to all emergency situations they might reasonably be expected to encounter, such as missing persons.
- A system is in place to warn staff of severe weather (or other emergency situations) and staff members know where to go for shelter or how to evacuate.
- Participants have been provided with relevant information about the program, including level of physical activity, appropriate clothing, equipment needed, safety concerns, etc.



KEY CHARACTERISTIC #5: PROGRAM QUALITY AND APPROPRIATENESS

Nonformal environmental education programs are built on a foundation of quality instructional materials and thorough planning.

5.1) Quality Instructional Materials and Techniques.

The environmental education program employs instructional materials and techniques of the highest quality.

What to look for:

- Any educational materials developed or used as part of the program include the characteristics of quality environmental education materials as outlined in NAAEE's *Environmental Education Materials: Guidelines for Excellence*. (See sidebar on next page.)
- Program elements and materials
 - are broadly inclusive and recognize the integral connections between environmental concerns and the wider questions of social needs, welfare, and economic opportunity.
 - are integrated with relevant curricula or with program goals from the organization.
 - comply with all applicable regulations, standards, and safety guidelines.
- Program elements, instructional strategies, and materials
 - reflect learning theory appropriate for the target audience. (See also Appendix C: Working with Adult Learners and Appendix D: What You Need to Know About Children Under Six.)
 - consider innovative and novel ways to achieve objectives rather than assuming that traditional or historical methods are most appropriate.
- aid in developing critical and creative thinking skills.
- are culturally and gender sensitive and inclusive, and are age, audience, and content appropriate.
- are integrated into an appropriate scope and sequence.
- The program uses instructional methodologies based on respected, research-based practices. Methods address the varied learning styles of audience members, including attention to theories of multiple intelligences.
- Life-long learning strategies are incorporated into program design.
- The overall program and specific activities are broadly accessible and are responsive to concepts and standards expressed in the Americans with Disabilities Act (ADA).
- The program
 - uses appropriate and effective technology.
 - is safe and comfortable for the audience.
 - is integrated into a continuum of environmental education, with readiness and follow-up activities conducted as appropriate.
- Materials have been reviewed by experts in education and subject matter and by their intended audience to assure that they are pedagogically sound, value-fair, and scientifically accurate.

Summary of *Environmental Education Materials: Guidelines for Excellence*

Environmental Education Materials: Guidelines for Excellence is designed to help the educator, administrator, curriculum designer, or materials developer evaluate the quality of environmental education materials. These *Guidelines* offer a way of judging the relative merit of different materials, a standard to aim for in developing new materials, and a set of ideas about what a well-rounded environmental education curriculum might be like.

The Guidelines point out six key characteristics of high quality environmental education materials:

Key Characteristic #1 –

Fairness and Accuracy

EE materials should be fair and accurate in describing environmental problems, issues, and conditions, and in reflecting the diversity of perspectives on them.

- 1.1 Factual accuracy;
- 1.2 Balanced presentation of differing viewpoints and theories;
- 1.3 Openness to inquiry; and
- 1.4 Reflection of diversity.

Key Characteristic #2 – Depth

EE materials should foster awareness of the natural and built environments; an understanding of environmental concepts, conditions, and issues; and an awareness of the feelings, values, attitudes, and perceptions at the heart of environmental issues, as appropriate for different developmental levels.

- 2.1 Awareness;
- 2.2 Focus on concepts;
- 2.3 Concepts in context; and
- 2.4 Attention to different scales.

Key Characteristic #3 –

Emphasis on Skills Building

EE materials should build lifelong skills that enable learners to address environmental issues.

- 3.1 Critical and creative thinking;
- 3.2 Applying skills to issues; and
- 3.3 Action skills.

Key Characteristic #4 –

Action Orientation

EE materials should promote civic responsibility by encouraging learners to use their

knowledge, personal skills, and assessments of environmental issues as a basis for environmental problem solving and action.

- 4.1 Sense of personal stake and responsibility; and
- 4.2 Self-efficacy.

Key Characteristic #5 –

Instructional Soundness

EE materials should rely on instructional techniques that create an effective learning environment.

- 5.1 Learner-centered instruction
- 5.2 Different ways of learning;
- 5.3 Connection to learners' everyday lives;
- 5.4 Expanded learning environment;
- 5.5 Interdisciplinary;
- 5.6 Goals and objectives;
- 5.7 Appropriateness for specific learning settings; and
- 5.8 Assessment.

Key Characteristic #6 – Usability

EE materials should be well-designed and easy to use.

- 6.1 Clarity and logic;
- 6.2 Easy to use;
- 6.3 Long-lived;
- 6.4 Adaptable;
- 6.5 Accompanied by instruction and support;
- 6.6 Make substantiated claims; and
- 6.7 Fit with national, state, or local requirements.

For more information on the Materials Guidelines, go to www.naaee.org/npeee

An Autumn Walk by a Stream A Natural Resource Leadership Retreat for Women

In 2001, the Kentucky Cooperative Extension Service sponsored An Autumn Walk in the Woods, A Natural Resource Leadership retreat for women. The retreat targeted women who, as volunteers or staff members, teach in extension programs in their own home areas. Retreat organizers recognized that although women often make natural resources decisions, they had historically been underserved by education programs. The retreat was such a success, it was repeated in 2002 and 2003.

The retreat was designed specifically to meet the needs of its target audience. The strategy of the Autumn Walk Series is to use local traditions and hobbies as interesting and effective teaching tools. The women participated in hands-on workshops led by natural resource specialists and artists. With their help, the women not only gained a better understanding of natural resource concepts, but also learned that natural resource education could be passed on through storytelling, painting, photography, and music.

The Autumn Walk Series has produced several notable products that the women now use as tools in their own education programs. A video on making paper used the participants as actors. A calendar included quotes and teaching tips by the participants. They composed a song that was sung by the music instructor and distributed on a CD. Poems and watercolor sketches created by the participants were included in a desktop flipchart that chronicles one of the retreats.

— Submitted by Gwenda Adkins, Elliott County (Kentucky) Extension Agent for Family and Consumer Sciences. From an article by Aimee D. Heald, University of Kentucky Agriculture Communications.

5.2) Field Testing.

Educational activities and strategies used in the environmental education program are tested to ensure their effectiveness.

What to look for:

- Educational activities, materials, and strategies are tested in the field with samples of the target audience, and revisions are made based on this testing whenever possible.
- The evaluation plan is implemented and updated as needed, based on field testing.
- Equipment, consumables, money, and other resources needed to conduct the program are assembled or readily available, and items are tested or reviewed before they are needed for the program.

5.3) Promotion, Marketing, and Dissemination.

The environmental education program has an effective promotion, marketing, and dissemination plan to ensure that it reaches its target audience and has the opportunity to achieve its goals and objectives.

What to look for:

- The availability and content of the program are widely known to target audiences in the local community, and elsewhere if appropriate. Members of the target audience(s) know how they can participate in the program and where they can obtain additional information about the program.
- Media contacts and publicity strategies are detailed in print for use on an ongoing basis.
- Event schedules are coordinated with partners and collaborators to avoid conflicts.

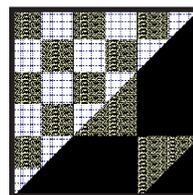
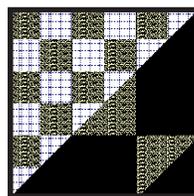
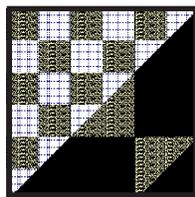
- To the extent possible, events are scheduled so as not to compete with other programs for the target audience(s) and in order to maximize opportunities for the target audience(s) to participate.
- Partners and collaborators help in marketing and promotion efforts.
- Programs are coordinated with other environmental education programs to maximize effect and opportunity for integration.
- Photographs (with signed releases from participants depicted in photos, granting their permission to publish or otherwise use the photographs), case studies, or other forms of documentation are collected to facilitate marketing and sharing of information gained.

5.4) Sustainability.

The environmental education program can be sustained if a long-term initiative is necessary for effectiveness.

What to look for:

- The program’s goals and objectives are valid and appropriate for the entire length of the program cycle.
- A long-term funding strategy for the program has been developed that details how the program will be continued after initial funding is exhausted. Alternatives such as fees for services and charging for materials are incorporated as appropriate.
- Partnerships and other “ownership” possibilities are included in strategies for sustaining the program.
- Accurate records of programs, goals, objectives, content, participants, training, resources, and evaluation results are compiled and kept in order to contribute to the organization’s institutional memory.



KEY CHARACTERISTIC #6: EVALUATION

Nonformal environmental education programs define and measure results in order to improve current programs, ensure accountability, and maximize the effects of future efforts.

Note: This section deals primarily with evaluation of program outcomes and impacts and is only one part of the overall evaluation cycle as indicated in the evaluation example below. Other parts of the cycle are included in previous sections of these guidelines (i.e., 1.1, 1.2, 1.3, 2.2, 3.1, 3.3, 4.2, 5.2, and 5.4). (See also Appendix E: Logic Models as a Tool for Program Development and Evaluation.)

6.1) Determination of Evaluation Strategies.

The environmental education program has both formative and summative evaluation built into key parts of its development.

What to look for:

- Evaluation techniques appropriate for the program and its goals have been determined up front.
- Assessment techniques and tools are integrated into the program and considered early in the planning stage.
- Measurement of program outcomes and impacts are integrated into the evaluation process.
- Type of program outputs, outcomes, and impacts (e.g., short-term, medium-range, and long-term) are appropriate given program goals, objectives, and duration.
- Overall evaluation design and the collection and analysis of data conform to accepted practices.
- Impacts are monitored on an ongoing basis, as appropriate, for the scope of the program.

6.2) Effective Evaluation Techniques and Criteria.

The environmental education program employs an effective evaluation strategy in order to promote success.

What to look for:

- The program evaluation determines the degree to which the program
 - contributes to overall environmental literacy.
 - meets stated goals, objectives, and learning outcomes.
 - used resources such as funds and supplies responsibly.
- The program is evaluated to determine if it addressed needs identified in the original needs assessment.
- The program evaluation includes ways to capture and assess unanticipated outcomes.

Increasing Public Awareness and Knowledge of Wildland Fire Through County Programs

During the summer of 1998 Florida experienced a severe wildfire season. Though no lives were lost, approximately 330 structures were damaged or destroyed and 500,000 acres were burned. Land managers and homeowners are not helpless against such a fury, however, and can take a variety of precautionary actions to reduce their risk of wildfire. In a special initiative led by University of Florida's Cooperative Extension Service, an education program was developed that targeted adult citizens living in rural and suburban Florida. The project increased awareness of the benefits of fire-dependent ecosystems and prescribed fire, the risks of living in wildfire-prone areas, and the actions that could be taken to reduce risk.

The project created a toolkit of resources and conducted training for county extension agents, Division of Forestry (DOF) field staff, and other agency staff. It began with a needs assessment of 675 randomly selected rural and suburban residents from northern and central Florida. A series of questions explored these residents' knowledge and attitudes about wildfires and prescribed fires. This information helped prioritize the development of fact sheets and modify program goals.

Twenty-three agencies and organizations interested in fire, landscaping, and natural resource management attended a workshop early on to better refine a common message about landscaping for fire in Florida. This cooperative approach generated new information and enabled the toolkit materials to promote concepts that were unique to Florida.

The goal of this project was for county extension agents and DOF personnel to share a locally specific message about wildland fire with a target audience by conducting public programs, establishing demonstration areas, and obtaining increased media coverage. To do this, the toolkit needed to have flexible, multiple resources. The kits included a manual,

press kit, CD-ROM, video library, fact sheets, brochures, doorhangers, educator guide, and a roadside sign. Experts reviewed the materials before production.

The toolkits were distributed at a series of one-day workshops held at three sites in northern and central Florida. The training workshops were designed to help county personnel adapt the toolkit resources, target high-risk populations, and deliver informative and influential programs. Training participants completed pre- and post-workshop assessments about fire management and the content and utility of the toolkits. By having forestry, fire and emergency management, and other resource specialists team up with their county extension agents during these workshops, extension agents were able to meet outside experts they could later tap to conduct programs, hold demonstration burns, and answer questions in their areas.

Toolkit users asked participants in their public programs to complete evaluation forms, which demonstrated that the participants had gained knowledge and intended to take some type of action. Follow-up phone calls one year later indicated these participants had reduced their risk of fire and that the information they received at the workshop complemented the messages they heard from other sources. County teams that returned reporting forms highlighted success stories of the public programs and media coverage, and expressed a need to increase attendance at these public programs.

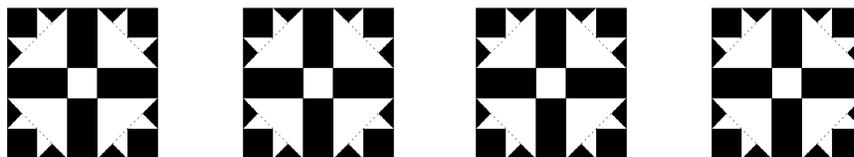
— *Submitted by Martha Monroe and Susan Jacobson, University of Florida; adapted from "Professional Development for Natural Resource Education: Florida's Wildland Fire Outreach Program." In Simmons, B. (ed.) Preparing Effective Environmental Educators. Washington, DC: NAAEE.*

6.3) Use of Evaluation Results.

Reasons for evaluating the environmental education program and the use of data obtained are considered as an integral part of program development.

What to look for:

- The intended uses and dissemination methods for the information developed during the evaluation process are specified beforehand and built into the evaluation process along with recommendations for revisions and improvements, cycle of evaluation and improvement, monitoring of results, etc.
- Evaluation results are reviewed to determine whether the needs of the participants, organization, partners, audience, sponsors, and funders have been met.
- Evaluation results are used
 - o to help determine areas of strength and potential gaps, how work has impacted the community, and how to function more effectively.
 - o within the planning group to identify strengths and achievements to be celebrated, to identify areas needing attention or improvement, to help clarify issues and/or build consensus, to provide direction, and to inform group decision-making.
- Staff should be able to speak knowledgeably about evaluation results.
- Systematic activities are planned to share evaluation results with the larger environmental education community so that successes, problems, and unintended outcomes can be used as learning tools by others.
- Measurements of the efficiency and effectiveness of staff, instructors, and volunteers are included in the evaluation.
- Attempts to measure the overall impact of the program and to document numbers served are included in the evaluation.



APPENDICES

Appendix A: Writing SMART Objectives

Effective program development and implementation depends on the clear articulation of goals and objectives. While goals provide a vision and overall description of the program, objectives chart expected outputs and outcomes. In writing meaningful objectives, many program developers have found a set of criteria, summarized by the acronym SMART, to be helpful. A SMART objective is:

Specific - Describes an action, behavior, outcome, or achievement that is observable.

Measurable - Details quantifiable indicator(s) of progress towards meeting the goal (e.g., 70% of participants..., five or more...).

Audience - Names the audience (e.g., workshop participants, community members) and describes outcomes from the perspective of the audience (i.e., what the audience will be able to do).

Relevant - Is meaningful, realistic, and ambitious; the audience can (given the appropriate tools, knowledge, skills, authority, resources) accomplish the task or make the specified impact.

Time-bound - Delineates a specific time frame.

Specific action words that describe what the learner will be able to do as a result of participating in the program are used in writing SMART objectives. Action words can help to categorize types of learning in a hierarchy ranging from simple to complex. For example, analysis is a different level of learning than is application. One of the best known tools for developing objectives is the 1956 publication *Taxonomy of educational objectives: The classification of educational goals. Handbook I. Cognitive Domain* by Benjamin Bloom and a team of educational psychologists. The *Taxonomy* categorizes six levels of learning that commonly occur in education settings: knowledge, comprehend, apply, analyze, synthesize, and evaluate. (See the following table for some of the verbs that could be associated with each of the six levels of learning.)

Examples of Action Words Used to Help Set Objectives for Different Levels of Learning					
KNOWLEDGE	COMPREHEND	APPLY	ANALYZE	SYNTHESIZE	EVALUATE
define	discuss	demonstrate	distinguish	design	appraise
record	explain	employ	debate	construct	assess
list	differentiate	illustrate	calculate	create	judge
name	identify	translate	diagram	propose	predict

Appendix B: Using Rubrics

Designing meaningful assessments of learning is essential to the development and implementation of effective nonformal environmental education programs. Assessments allow us to gauge whether expected learner outcomes have been achieved. Many educators have found the use of rubrics to be a valuable tool when assessing

learner outcomes. Rubrics can be thought of as a logical extension of program and instructional objectives. With a well-written rubric, it is reasonable to expect that all performances will be measured with the same yardstick. Additionally, when rubrics are used, learners know what is to be expected of them.

SAMPLE RUBRIC:

Taking water samples

SCORE	SAFETY: Degree to which learner follows correct safety procedures	PROCEDURES: Degree to which learner follows proper mechanics in water quality analysis	RESULTS: Degree to which learner obtains proper sample values	INTERPRETATION: Degree to which learner develops likely hypotheses
4 Fully meets standards	Handles chemicals and glassware safely.	Obtains uncontaminated samples and follows correct steps for pH analysis.	Both samples within .3 points of the correct pH.	Can list three plausible reasons why the pH of the two samples differs and can defend reasoning behind hypotheses.
3 Partially meets standards	No serious safety issues during analysis, but procedures deviate from ideal.	Has some problems following instructions, but procedure adequate for approximate correct test results.	One sample within .3 points of the correct pH.	Can list two plausible reasons why the pH of the two samples differs and can defend reasoning behind hypotheses.
2 Major departure from some aspect of standards	Shows some concern or knowledge about safety issues, but is careless in handling materials.	Major problems with procedures that will likely yield incorrect results.	Neither sample within .3 points, but at least one sample within .5 points.	Can list one plausible reason why the pH of the two samples differs and can defend reasoning behind hypothesis.
1 Does not meet standards	Disregards safety concerns when handling materials.	Does not follow necessary steps in analysis and cannot obtain useful results.	Neither sample within .5 points.	Cannot list even one plausible reason why the two samples differ.

Appendix C: Working with Adult Learners

Understanding the audience is essential to the success of an environmental education program, particularly when working with adult learners.

Adult Learners...
<p>...need to feel physically and mentally comfortable during learning experiences.</p> <p><i>Avoid situations where self-esteem could be harmed.</i></p>
<p>...often participate in nonformal learning for social reasons.</p> <p><i>Include opportunities to interact with others and to discuss ideas.</i></p>
<p>...enjoy learning from peers and bring considerable and diverse life and learning experiences.</p> <p><i>Differing life stages and viewpoints should be honored, accommodated, and utilized to increase learning.</i></p>
<p>...create personal meaning and understanding from learning.</p> <p><i>Build in opportunities for active learning and allow time for participants to reflect individually on their learning.</i></p>
<p>...want to know how information presented is relevant and applicable in their personal and professional lives.</p> <p><i>Build in opportunities to apply learning.</i></p>
<p>...are voluntary participants and prefer self-directed learning.</p> <p><i>Programming should be focused, yet flexible enough for adults to take away what is best suited to their needs. Involve participants in setting educational goals. Clarify expectations.</i></p>
<p>...enjoy active learning and direct participation. Involve participants in discussions and hands-on activities.</p> <p><i>Avoid long lectures and periods of sitting.</i></p>
<p>...make a conscious decision to participate in a learning situation and are guided through an experience by their motivation to learn.</p> <p><i>Adults are aware of their learning.</i></p>
<p>...need to feel a sense of equality and respect in order to fully appreciate an experience.</p> <p><i>Treat adults as equals.</i></p>

Appendix D: What You Need to Know About Children Under Six

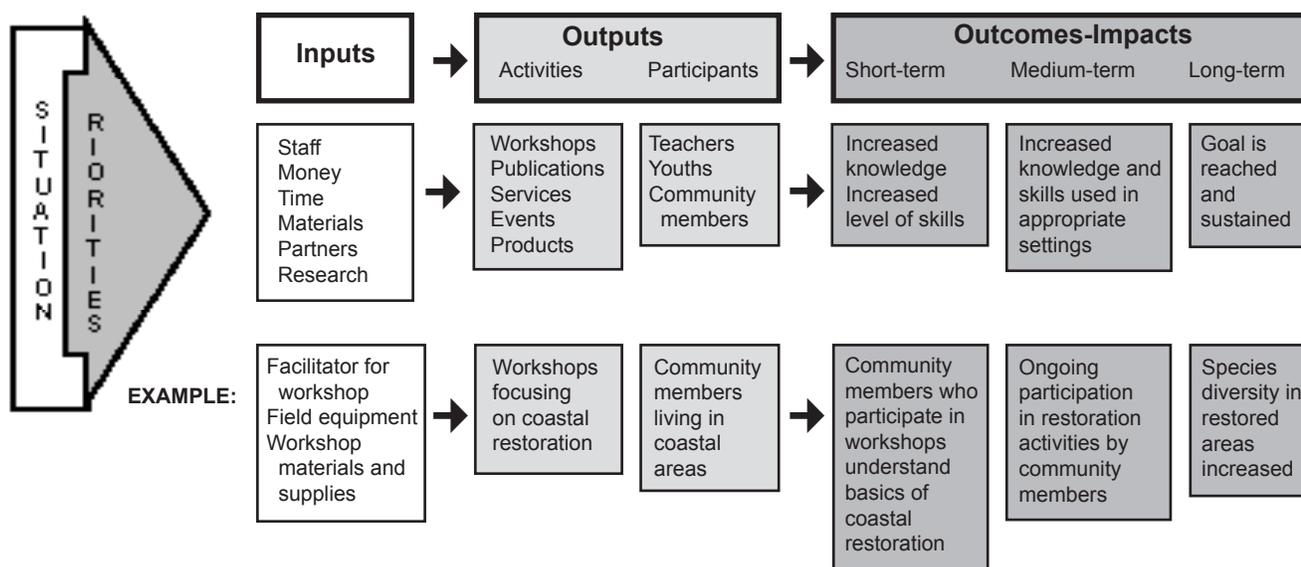
What you need to know about children under six	What you can do to help them learn and grow
<p><i>They think differently than we do.</i></p> <p>Concrete thinkers.</p> <p>No concept of time.</p> <p>Appearance is reality.</p> <p>Cannot think logically or abstractly.</p> <p>Think inanimate objects have feelings, thoughts, and desires.</p> <p>Can think of only a few things at one time.</p>	<p>Choose topics relevant to their lives and limited experience.</p> <p>Choose concrete topics—clouds, not weather; squirrels, not mammals.</p> <p>Use simple language—avoid clichés.</p> <p>Use mystery, puppets, etc., to capture attention.</p> <p>Avoid referring to the past or future.</p> <p>Give one or two directions at a time and repeat activities.</p>
<p><i>Everything is about “Me!”</i></p> <p>Think everyone thinks, feels, and acts like they do.</p> <p>Rigid sense of equality and fairness.</p> <p>Unable to distinguish between intentional and unintentional acts.</p>	<p>Use puppets, costumes, and dramatic play to give children a change of perspective.</p> <p>Make sure everyone can participate to the same extent.</p> <p>Provide enough time and materials for everyone.</p>
<p><i>When in doubt, they make it up.</i></p> <p>They construct their own understandings of how the world works.</p> <p>Develop their own theories about the world based on prior knowledge and experience.</p>	<p>Instead of correcting inaccurate information, find out why they think what they do.</p> <p>Use open-ended questions to challenge them to think in different ways.</p> <p>Facilitate learning rather than teach facts.</p>
<p><i>They can do it themselves!</i></p> <p>Learn best when they can decide for themselves what, when, and how to do things.</p>	<p>Provide lots of materials for experimentation.</p> <p>Provide choice whenever possible.</p> <p>Provide enough time and space to explore things thoroughly.</p>
<p><i>They are learning about everything all at once, all the time.</i></p> <p>Learning occurs through every domain—social, cognitive, physical, emotional, and so forth.</p> <p>Playing is learning.</p>	<p>Integrate natural concepts in with social play, material manipulation, and hands-on experimentation.</p> <p>Incorporate movement into programs.</p>
<p><i>They make sense of their world through play.</i></p> <p>Like to experience new things in familiar ways and familiar things in new ways.</p> <p>Approach materials in four stages: awareness, exploration, inquiry, and utilization.</p>	<p>Use familiar stories, songs, nursery rhymes, and so forth, but add a new verse or twist.</p> <p>Don’t jump into teaching facts before children have had a chance to explore and experiment.</p>

From *Natural Wonders: A Guide to Early Childhood for Environmental Educators*. Marcie Oltman, editor (2002). MN: Early Childhood Environmental Education Consortium. Reprinted with permission from the Minnesota Children’s Museum and the Minnesota Office of Environmental Assistance.

Appendix E: Logic Models as a Tool for Program Development and Evaluation

The logic model provides a visual representation of the program and its evaluation. The logic model illustrates the relationships among the various program components: initial situation (e.g., degraded coastal areas with declining numbers of species), identified priorities (e.g., restoring coastal areas, increasing species diversity); inputs (i.e., resources needed to accomplish a set of activities); outputs (i.e., activities designed to accomplish the program goal, as well as the audiences that participate in those activities); and short-term (immediate), medium-term (2-3 years), and long-term (4-10 years) outcomes-impacts. The logic model can help guide program planning, implementation, and evaluation. It can serve as a tool for clarifying program elements, identifying evaluation questions and indicators, and conducting ongoing self-evaluation.

Logic Model, Evaluation Questions, and Indicators



Evaluation Questions: What do you want to know?

Were the inputs sufficient and timely? Did they meet the program goals?	Did all activities occur as intended? What was the quality of the intervention? Was the content appropriate?	Did targeted community members participate? Who did not participate? Who else was reached?	Did knowledge increase? Did understanding of coastal restoration techniques increase? What else happened?	Are community members continuing to participate in restoration activities? Are they participating in other activities?	To what extent has the biodiversity of the targeted coastal area been increased? In what other ways has ecosystem quality increased?
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Indicators: How will you know it?

# staff; \$ invested; Delivery timetable	# workshops scheduled; Publications printed; # events	Actual vs. desired attendance; #, % that attended per workshop or session	#, % with increased knowledge of coastal restoration; Additional outcomes: +, -	#, % using new knowledge and skills to monitor progress of restoration activities; Additional outcomes: +, -	# of species recovered; Other positive environmental benefits; Additional outcomes: +, -
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Adapted from Taylor-Powell, E., Jones, L. & Henert, E. (2002) Enhancing Program Performance with Logic Models. Retrieved December 1, 2003, from the University of Wisconsin-Extension web site: www.uwex.edu/ces/pdande/evaluation/pdf/WaterQualityProgram.pdf.

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GLOSSARY OF KEY TERMS

Assessment: Evaluation of skills and knowledge acquired by learners during a learning experience. Assessment can take many forms, from basic testing such as true/false, multiple choice, or matching tests to documenting complex thinking skills and performances.

Comprehensive State Plan: Charts a course of action and provides an implementation schedule for meeting state goals for environmental education. These plans set forth the goals and objectives for environmental education within the state and typically list who is best suited to achieve or implement these goals and objectives (e.g., the legislature, the business community, school administrators, etc.).

Creative Thinking: Thinking which results in connections or possibilities previously unrecognized or unknown to the learner.

Critical Thinking: Analysis or consideration based on careful examination of information or evidence. Critical thinking relies on thoughtful questioning and logical thinking skills such as inductive and deductive reasoning.

Education: The imparting or creation of knowledge through any of several means including training, instruction, and facilitation.

Educational Objective: A statement of a specific measurable or observable result desired from an activity.

Environmental Education: A process that enables people to acquire knowledge, skills, and positive environmental experiences in order to analyze issues, assess benefits and risks, make informed decisions, and take responsible actions to achieve and sustain environmental quality. (NAAEE, 1993.)

Environmental Interpretation: "...an educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media rather than simply to communicate factual information." (Tilden, 1957). Usually occurs in parks and natural areas with non-captive audiences (i.e., visitors).

Environmental Issue: Related to, but distinguished from, an environmental problem. An environmental issue reflects the presence of differing perspectives on possible solutions to an environmental problem.

Environmental Justice: "...the pursuit of equal justice and equal protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, and/or socioeconomic status." (University of Michigan Environmental Justice Information Page: www-personal.umich.edu/~jrajzer/nre/)

Environmental Literacy: Possessing knowledge about the environment and issues related to it; capable of, and inclined to, further self-directed environmental learning and/or action.

Environmental Problem: An environmental problem is a specific example of existing or potential environmental degradation, destruction, pollution, etc.

Environmental Social Marketing: An education approach that employs a structured analysis of the barriers to and benefits of behavior change, and then includes design of media and strategies to bring about those changes.

Evaluation: A process designed to determine if planned outcomes have been achieved.

Formative Evaluation: Collecting information and data about your program during its implementation with the goal of using the information and data to improve the program as it is implemented.

Goal: A desired result from an activity, lesson, or course of study.

Higher-Order Thinking Skills: Skills reflective of more complex thought processes, such as the synthesis of new knowledge or analysis of data versus less complex processes such as rote recall or simple recognition.

Informal Environmental Education: Any unstructured environmental education activity outside the formal system where people learn from exhibits, mass media, and everyday living experiences. Also referred to as free choice environmental education. (The term is frequently used interchangeably with nonformal environmental education, especially within the science education community.)

Logic Model: A program design and evaluation tool that details the relationship among expected program components (inputs), activities and participation rates (outputs), and impacts (short-term, medium-term, long-term).

Needs Assessment: The part of the overall planning and evaluation cycle that ascertains the need for a particular program by considering such things as audience interest and knowledge, environmental conditions, etc. Also known as front-end evaluation.

Nonformal Environmental Education: Education about the environment that takes place at nonformal settings such as parks, zoos, nature centers, community centers, youth camps, etc., rather than in a classroom or school. Any organized educational activity about the environment that takes place outside the formal education system. (The term is frequently used interchangeably with informal environmental education.)

Objective: A statement of a specific measurable or observable result desired from an activity. See Educational Objective.

Program: The term “environmental education program” is used in these guidelines to mean an integrated sequence of planned educational experiences and materials intended to produce a particular set of outcomes.

Rubric: Specific descriptions of performance of a given task at several different levels of quality. Teachers use rubrics to evaluate student performance on performance tasks. Students are often given the rubric, or may even help develop it, so they know in advance what they are expected to do. (ASCD, A Lexicon of Learning, www.ascd.org/cms/index.cfm?TheViewID=1112)

Standard: A clear and specific statement of what a learner should know or should be able to achieve.

Summative Evaluation: Focuses on the documentation of outputs (e.g., number of participants reached, number of events held) and impacts/outcomes (e.g., level of knowledge gained, changes in social, economic, or environmental conditions) of the program once it is completed.

THE NATIONAL PROJECT FOR EXCELLENCE IN ENVIRONMENTAL EDUCATION

What does it mean to be environmentally literate? The National Project for Excellence in Environmental Education, initiated by the North American Association for Environmental Education (NAAEE) in 1993, is attempting to answer that question. Environmental education is a process that aims to develop an environmentally literate citizenry that can compete in our global economy; has the skills, knowledge, and inclinations to make well-informed choices; and exercises the rights and responsibilities of members of a community.

Publications

Publications created by the National Project for Excellence in Environmental Education include:

- ***Environmental Education Materials: Guidelines for Excellence*** (4th edition, 2009). A set of recommendations for developing and selecting environmental education materials.
- ***Excellence in Environmental Education: Guidelines for Learning (K-12)*** (4th edition, 2010). A comprehensive framework for environmental education, demonstrating environmental education's alignment with national academic standards.
- ***Excellence in Environmental Education: Guidelines for Learning (K-12) Executive Summary & Self Assessment Tool*** (4th edition, 2010). An easy-to-use outline listing the guidelines and a set of checklists for analyzing educational activities.
- ***Guidelines for the Preparation and Professional Development of Environmental Educators*** (3rd edition, 2010). A set of competencies for educators preparing to teach environmental education in a variety of job settings.
- ***Nonformal Environmental Education Programs: Guidelines for Excellence*** (2nd edition, 2009). A set of recommendations to be used in the development of comprehensive environmental education programs or to trigger improvements in existing ones.
- ***Early Childhood Environmental Education Programs: Guidelines for Excellence*** (2010). A set of recommendations to be used in the development of comprehensive early childhood environmental education programs or to trigger improvements in existing ones.
- ***Environmental Education Materials: Guidelines for Excellence Workbook - Bridging Theory and Practice*** (2000). Activities and examples to deepen your understanding of *Environmental Education Materials: Guidelines for Excellence*.

Hard copies of the *Environmental Education Guidelines* publications can be ordered from NAAEE at www.naaee.org/publications/guidelines-for-excellence.

Free copies may be downloaded from NAAEE's Web site at www.naaee.org/programs-and-initiatives/guidelines-for-excellence.

- ***The Environmental Education Collection: A Review of Resources for Educators, Volume 1*** (1997, updated 2004).
- ***The Environmental Education Collection: A Review of Resources for Educators, Volume 2*** (1998, updated 2004).
- ***The Environmental Education Collection: A Review of Resources for Educators, Volume 3*** (1998, updated 2004).

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