Guidelines for Environmental Educators in Colorado

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A Project of the
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Table of Contents

Acknowledgements

A committee of the Colorado Environmental Education Advisory Council was tasked with creating state-specific guidelines that define competency for environmental education (EE) practitioners. This diverse group of dedicated individuals represents the interests of many sections of the EE community including state agencies, non-profit organizations, nature centers, schools, higher education, and interpretation. This committee began meeting in January 2005 to create these guidelines.

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Introduction

In the late 1990's, the North American Association for Environmental Education (NAAEE) developed the National Project for Excellence in Environmental Education (NPEEE), which includes a five-volume set of guidelines for the best practices in EE.

The Colorado EE community continued the journey to excellence in May 2002, when a committee of the Advisory Council began developing the Resource Review System (see http://www.caee.org/QA.html for details), which focuses on the quality of EE programs and materials. Although resource quality was seen as a necessary first step, throughout this process the EE community felt it was imperative to also address the quality of how EE programs are *delivered and performed*. A leadership team formed to address this issue, and identified the need to develop guidelines that focus on the environmental educator. The result of their work is this document, intended to help environmental educators define and understand the skill set necessary for *providing* high quality EE in Colorado.

Development

The NPEEE includes *Guidelines for the Preparation and Professional Development of Environmental Educators,* NAAEE 2004, which is a set of recommendations about the knowledge and abilities educators need to provide high quality EE. Based on NAAEE's work, USEE and MEEA developed state level guidelines for environmental educators. In addition, four state EE associations - Utah, Texas, Kentucky, and Georgia - have developed certification programs for environmental educators based on NAAEE's *Guidelines*.

In an effort to avoid duplication of existing resources, the *Colorado Guidelines* were developed by reviewing and adapting relevant information from a variety of high quality sources. The committee reviewed the four state certification programs and based the *Colorado Guidelines* primarily on four documents:

- *Guidelines for the Preparation and Professional Development of Environmental Educators,* NAAEE 2004
- *Guidelines for Montana Environmental Educators,* MEEA, 2004
- *Guidelines for Environmental Educators in Utah,* USEE, 2002
- *National Council for the Accreditation of Teacher Education (NCATE) EE Program Standards*, NAAEE, Review Draft, November 2004

The first draft was available through the CAEE website at the beginning of April 2005. This marked the beginning of the public comment period, which ended on May 1, 2005. The committee addressed these comments in creating the final version of the guidelines.

Use

This document represents the first step in developing competencies for EE providers in Colorado to improve the effectiveness, validate the credibility, and strengthen the consistency of how EE programs are delivered. These guidelines could be used for a variety of purposes, including:

- To self-assess skills
- To guide staff hiring, training, and assessment
- To promote professionalism and provide professional development for yourself, your colleagues, and the field of EE

Organization
Colorado Guidelines are organized into five themes that describe a knowledge or skill area that must be mastered to gain competency as an environmental educator. General guidelines under each theme further explain the knowledge and skills to be mastered. Each guideline is then broken down into indicators that give examples of skills or knowledge that demonstrate the guidelines and suggest ways of assessing the abilities of environmental educators. Indicators are not intended to be all-inclusive and not all indicators will apply to every EE situation. The leadership team has tried to capture the wide spectrum of EE providers to provide useful recommendations for as many as possible.

A list of references is provided at the end of this document. Readers are encouraged to refer to the original source documents for additional information.

Guidelines at a Glance

This list includes the five themes and general guidelines for competency in environmental education.

Theme 1 - Environmental Literacy
1.1 Questioning, Analysis and Interpretation Skills
1.2 Knowledge of Environmental Processes and Systems
1.3 Processes of Addressing Environmental Issues
1.4 Personal and Civic Responsibility
1.5 Environmental Sensitivity

Theme 2 - Foundations of Environmental Education
2.1 Fundamental Characteristics and Goals of Environmental Education
2.2 How Environmental Education is Implemented
2.3 The Evolution of the Field of Environmental Education

Theme 3 – Professional Responsibilities of the Environmental Educator
3.1 Emphasis on Education, Not Advocacy
3.2 Ongoing Learning and Professional Development

Theme 4 - Planning and Implementing Environmental Education
4.1 Knowledge about Learners and Learning
4.2 Knowledge of Various Teaching Methods
4.3 A Climate for Learning About and Exploring the Environment
4.4 An Inclusive and Collaborative Learning Environment
4.5 Settings for Instruction
4.6 Planning for Instruction
4.7 Flexible and Responsive Instruction
4.8 Knowledge of Environmental Education Materials and Resources
4.9 Technologies that Assist Learning
4.10 Curriculum Planning

Theme 5 - Assessment and Evaluation
5.1 Assessment and Evaluation Defined
5.2 Learner Outcomes
5.3 Assessment that is Part of Instruction
5.4 Improving Instruction
5.5 Evaluating Programs

Theme 1: Environmental Literacy

Environmental educators possess the knowledge and skills associated with environmental literacy. Environmental educators should not only possess the competency to help their learners achieve these objectives but also embrace the spirit of environmental literacy by modeling it in their own endeavors.

The outline below offers a broad summary of the content knowledge and basic skills required of environmentally literate educators. For a complete and detailed listing of content that should be provided to create environmentally literate students, please refer to the North American Association for Environmental Education (NAAEE) document, *Excellence in Environmental Education – Guidelines for Learning (PreK-12).*

> **Theme 1**
> **Environmental Literacy**
>
> 1.1 Questioning, Analysis and Interpretation Skills
>
> 1.2 Knowledge of Environmental Processes and Systems
>
> 1.3 Processes of Addressing Environmental Issues
>
> 1.4 Personal and Civic Responsibility
>
> 1.5 Environmental Sensitivity

1.1 Questioning, Analysis and Interpretation Skills

Developing environmental literacy depends on a willingness and ability to ask questions about the surrounding world, speculate and hypothesize, seek and evaluate information, and develop answers to questions. Environmental educators understand and can communicate the processes of investigation; and design, conduct, and evaluate such investigations.

> "Environmental literacy is an individual's capacity to UNDERSTAND broadly how people and societies RELATE to each other and to natural systems, and how they might do so SUSTAINABLY; to SEE connections and interrelatedness, and to ACT successfully on those insights in daily life."-James Elder

For example:

- Model the basic modes of inquiry and application of environmental investigations in instruction.
- Ask questions and state hypotheses, using prior knowledge to help guide the development of environmental awareness and investigations of various types.
- Create a written plan for scientific investigations.
- Create opportunities for experiences to answer particular questions about the environment.
- Collect information by selecting and using appropriate technologies to gather, process, and analyze data and to report information related to an investigation.
- Organize and display information in ways appropriate to different types of environmental investigations and purposes. Work with models and simulations.
- Construct and revise explanations and models using evidence, logic, and experiments that include identifying and controlling variables.
- Evaluate accuracy and reliability of explanations and models to identify major sources of error or uncertainty within an investigation (e.g., particular measuring devices and experimental procedures).
- Communicate new understandings.

1.2 Knowledge of Environmental Processes and Systems
Environmental literacy hinges on understanding the processes and systems that comprise the environment, including human social systems and their influences. That understanding is based on knowledge synthesized from across the traditional disciplines (especially the natural and social sciences) and includes knowledge about:

- Processes and interactions of Earth's systems and the structure and dynamics of Earth, including how physical processes shape Earth's surface patterns and systems.
- Characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment, including the interrelationships of matter and energy in living systems and how organisms change over time in terms of biological evolution and genetics.
- Physical and human characteristics of places, and how to use this knowledge to define and study individuals, groups, and regions and their patterns of change.   Knowledge of how culture and experience influence people's perceptions of places and regions.
- Environment and society including human/environment interactions; effects and patterns of human populations and how the population affects all aspects of the environment.
- Effects of interactions between environmental systems (including human and physical) and the changes in meaning, use, distribution, and importance of resources.

1.3 Processes of Addressing Environmental Issues
Environmental educators understand that environmental literacy includes the abilities to research, evaluate, and act on environmental issues. The skills and knowledge outlined in the first two guidelines are applied and refined in the context of these issues.
For example:

- Be familiar with monitoring techniques to collect data about environmental problems.
- Describe appropriate questions for determining whether or not action on an issue is warranted.
- Understand and participate in the decision-making process.
- Apply research skills to determine attitudes, beliefs, and values held by different stakeholders involved with an issue.
- Analyze and evaluate the influence of various forms of individual action on an environmental issue.
- Explore and analyze the causes, consequences, and possible solutions to persistent, contemporary, or emerging environmental issues.
- Identify and implement strategies for preventing or resolving environmental issues.

1.4 Personal and Civic Responsibility
Environmental educators understand how people exercise the roles, rights and responsibilities of participation in civic life at all levels - local, state, and national.
For example:

- Understand the process of creating regulations related to environmental quality.
- Identify and exercise individual rights and responsibilities.
- Describe the nature of environmental issues and the role of beliefs and values.
- Be involved in responsible environmental behaviors: persuasion, consumer/economic, political, legal, direct intervention/eco-management, etc.

- Be familiar with research about the best predictors of responsible environmental behavior.
- Use models of teaching responsible environmental behavior (e.g., case study, issue investigation, sharing of personal experiences).

1.5 Environmental Sensitivity

Environmental educators understand the importance and facilitate the development of environmental sensitivity – one's connection to and awareness of the natural world - in fostering environmentally literate behavior.

For example:

- Describe variables influencing development of environmental sensitivity (e.g., time spent outdoors, reading environmental literature, role models, development of an ecological identity).
- Be familiar with the relative importance of environmental sensitivity variables in predicting responsible environmental behavior.
- Describe experiences that can influence development of environmental sensitivity (i.e., educational experiences, personal impressions, intuitions and feeling responses).
- Use a variety of methods that can influence development of environmental sensitivity, for example: outdoor education, environmental literature and art, experiences with environmental role models and sense of place principles.

Theme 2 - Foundations of Environmental Education

Environmental educators have a basic understanding of the goals, theory, practice, and history of the field of environmental education. This knowledge provides a solid foundation on which educators can build their own practice.

> **Theme 2:**
> **Foundations of**
> **Environmental Education**
>
> 2.1 Fundamental Characteristics and Goals of Environmental Education
>
> 2.2 How Environmental Education is Implemented
>
> 2.3 The Evolution of the Field of Environmental Education

2.1 Fundamental Characteristics and Goals of Environmental Education

Environmental educators understand environmental education as a distinct field and know its defining characteristics and goals.

For example:

- Identify the goals and objectives of environmental education as laid out in founding documents of the field, such as the Belgrade Charter (UNESCO-UNEP, 1976) and Tbilisi Declaration (UNESCO, 1978), as well as in more recent definitions such as Agenda 21 (UNCED, 1992).
- Know about the goals and objectives for environmental education in Colorado as described in the 2005 Colorado Environmental Education Master Plan.
- Describe the broad view that environmental education takes of "environment," incorporating concepts such as systems, interdependence, and interactions among humans, other living organisms, the physical environment, and the built or designed environment.
- Characterize environmental education as an interdisciplinary field and provide examples of ways in which it draws on and integrates knowledge and skills from across different subjects.
- Understand how environmental education's focus on environmental literacy relates to the need to provide opportunities for learners to move from awareness to informed action.
- Recognize environmental education as a tool toward environmental stewardship.

2.2 How Environmental Education is Implemented

Environmental educators understand that environmental education encompasses a variety of settings, audiences, providers, and methods and that sources of support, program requirements, and other factors vary from context to context. For a statewide listing of environmental education programs and resources, visit CAEE's online database/directory at www.caee.org.

For example:

- Identify individuals, organizations, and agencies delivering formal and nonformal environmental education programs.
- Be familiar with national, regional, state, and local environmental education programs and support services, including funding sources and resources.
- Identify efforts to link formal education and nonformal programs through partnerships and collaborations.
- Understand how school policies, state or local mandates, and federal legislation influence environmental education efforts.
- Describe ways in which environmental education supports education reform goals.

- Identify environmental education's role in professional development and continuing education experiences.
- Describe how different methods of environmental education fit into the overall goal of developing responsible environmentally literate individuals.

2.3 The Evolution of the Field of Environmental Education
Environmental educators are familiar with the growth of the field of environmental education. For example:

- Discuss how various educational and social movements have contributed to the development of the field of environmental education. Identify how these movements differ from environmental education, and discuss their influence today.
  > Examples of these movements include: education-based (natural history, outdoor education, conservation education, ecology education, challenge/adventure education and inquiry-based), social and cultural awareness (recreation, Native American Heritage, and environmental justice) and environmental (watershed approach, human health, and sustainability).
- Discuss how the work of bodies such as the Brundtland Commission (Brundtland, 1987), the United Nations Conference on Environment and Development (UNCED, 1992), the International Conference on Environment and Society (UNESCO 1997), and the World Summit on Sustainable Development (2002) has influenced—or might influence—environmental education. Other works to discuss include Environmental Protection Agency's report on Environmental Justice, *Agenda 21*, Earth and Faith and work from the National Science Teacher Association (NSTA).
- Identify current and emerging issues in the field of environmental education. For example, evaluate assertions that environmental education focuses more on advocacy rather than education and discuss how these assertions are affecting environmental educators and education programs. Other examples might include: reduction of content with field-based work, scientific accuracy of EE instruction, liability, and evaluation and assessment.
- Discuss how current educational reform in related fields shape and support current practices in environmental education (i.e., NSTA standards, National Resource Council Standards, No Child Left Behind, CSAP, etc.).
- Discuss past and current research findings from environmental education and their effect on how environmental education might be perceived, defined, or practiced.
- Understand and appreciate the historical events in environmental education in Colorado. A historical perspective allows one to identify trends and cycles. See Appendix C for a brief history of environmental education in Colorado.

Theme 3 – Professional Responsibilities of the Environmental Educator

Environmental educators in Colorado understand and accept the responsibilities associated with practicing environmental education. Environmental educators maintain consistent and high standards for instruction and professional conduct.

> **Theme 3**
> **Professional Responsibilities of the Environmental Educator**
>
> 3.1 Emphasis on Education, Not Advocacy
>
> 3.2 Ongoing Learning & Professional Development

3.1 Emphasis on Education, Not Advocacy

Environmental educators provide accurate, objective, balanced, and effective instruction that acknowledges different views and opinions about environmental conditions, issues or actions.

For example:

- Identify and implement instructional techniques to present differing viewpoints and theories in a balanced manner and identify potential sources of bias in information.
- Differentiate among instructional materials on the basis of their factual accuracy. Select and use materials that together present a range of differing viewpoints and interpretations where there are differences of opinion or competing scientific explanations.
- Weigh evidence regarding environmental problems based on validity and reliability of research (e.g., from scientific societies or reputable journals).
- Identify and implement instructional strategies and techniques that encourage learners to explore different perspectives and form and explain their own opinions.

3.2 Ongoing Learning and Professional Development

Environmental educators are active learners in their professional lives.

For example:

- Continually update and expand existing knowledge and information about the environment and related issues, current research, environmental education materials, and instructional methods. For example, critically read scientific journals or actively participate in local, state, national, or international organizations associated with environmental education, or participate in a professional certification program.
- Develop professional relationships with mentors, advisors, and others to expand and upgrade knowledge, skills, and understanding of differing points of view about environmental issues.
- Reflect on and learn from personal practice as an environmental educator, both individually and with other professionals and colleagues. Use tools such as peer coaching, portfolios, and journals.
- Seek out opportunities to learn essential content and skills in real-world environmental settings or contexts, especially within the communities and ecosystems in which one lives and teaches.

Theme 4 - Planning and Implementing Environmental Education

Environmental educators combine high-quality education with the unique features of environmental education to design and implement effective instruction. Environmental educators enable learners to engage in inquiry and investigation, especially when considering environmental issues that are controversial and require learners to seriously reflect on their own and others' perspectives. Proper preparation should enable environmental educators to provide the interdisciplinary, hands-on, investigative learning opportunities that are central to environmental education. Environmental educators foster an environment such that student interactions are conducive to learning.

Theme 4 - Planning and Implementing Environmental Education

4.1 Knowledge about Learners & Learning

4.2 Knowledge of Various Teaching Methods

4.3 A Climate for Learning About & Exploring the Environment

4.4 An Inclusive & Collaborative Learning Environment

4.5 Settings for Instruction

4.6 Planning for Instruction

4.7 Flexible & Responsive Instruction

4.8 Knowledge of Environmental Education Materials & Resources

4.9 Technologies that Assist Learning

4.10 Curriculum Planning

4.1 Knowledge about Learners and Learning

Environmental educators tailor instructional approaches to meet the needs of different learners in an engaging and challenging way. Whenever possible, accommodations for learners with special needs will be made.
For example:

- Model methods for presenting the environment or environmental issues in appropriate and engaging ways for learners of different ages, genders, backgrounds, levels of knowledge, and developmental abilities. (This range may include adults, especially for educators in nonformal settings.)
- Select environmental education materials and strategies that are developmentally appropriate and adjust these in response to individual differences among learners.
- Demonstrate an understanding of different learning and cognitive styles and the idea of multiple intelligences to reach all learners.
- Recognize and acknowledge varying socio-cultural perspectives present in groups of learners and tailor instructional approaches to respond to these perspectives while using them as an educational resource.

4.2 Knowledge of Various Teaching Methods

Environmental educators are familiar with and can employ a range of instructional methods.
For example:

- Select among relevant environmental topics and issues for study based on learners' interests and their ability to construct knowledge to gain conceptual understanding.
- Use a variety of teaching methods and strategies appropriate for the environmental education content and context, such as: hands-on, discovery, inquiry, cooperative learning, community-based, problem solving, service learning, simulations, models, role playing, case studies, interpretation, problem-based and place based learning.
- Select instructional methodologies based on learning objectives, learner characteristics, time requirements, involvement of community members, community dynamics and policies, available resources, and the instructional setting.

4.3 A Climate for Learning About and Exploring the Environment
Environmental educators create a climate in which learners are intellectually stimulated and motivated to learn about their environment.
For example:
- Employ instructional practices to encourage self-directed lifelong learning.
- Encourage mindful and independent thinking and expression of thought to help meet environmental education's goal of developing environmentally literate individuals.
- Recognize and incorporate learners' prior knowledge and experience.
- Excite and engage the audience.
- Provide experiences that increase learners' awareness of and appreciation for the natural, as well as human-designed, environment.
- Incorporate opportunities for learners to have first-hand experiences exploring the world around them.
- Use instructional techniques that encourage learners to ask questions, work cooperatively, and explore a variety of answers.

4.4 An Inclusive and Collaborative Learning Environment
Environmental educators foster openness and collaboration among participants and create an inclusive learning environment.
For example:
- Encourage flexibility, creativity and openness by recognizing that learners' conclusions and decisions are influenced by different assumptions and interpretations about the environment, particularly on environmental issues.
- Relate learners' capacity for collaborative work to their ability to function as responsible and effective individuals.
- Model responsible, respectful, and reasoned behavior during instruction.

4.5 Settings for Instruction
Environmental educators understand the importance of and ensure a safe and conducive learning environment both indoors and outside.
For example:
- Understand that teaching outside requires different safety measures and group/class management skills and strategies than teaching in a classroom.
- Identify, create, and use diverse settings for environmental education appropriate to various subject matters and resources, while promoting positive stewardship for the locations being used for instruction and the learner's sense of place. These may include: school yards, laboratories, field settings, community settings, museums, zoos, and demonstration sites.
- Identify, develop or implement responses to real or perceived barriers to using expanded settings (such as outdoor settings) in an educational and safe manner.
- Link content to learners' local surroundings and experience, then expand learners' application of the instruction, as appropriate, to larger environmental issues and contexts.

4.6 Planning for Instruction
Environmental educators plan environmental education instruction and programs that meet specific instructional goals.
For example:
- Produce a plan for environmental education instruction and demonstrate how the overall plan with specific elements (such as instructional or daily activities, pre- and post- field trip activities, etc.) enhance coordination or integration across disciplines and help to meet specific goals of environmental education.
- Have clear expectations of what objectives can be met in the time frame available.
- Include appropriate reflective and summative time at the end of each session.
- Design curriculum and instruction to make connections and empower the students.
- Develop a plan for a coherent, focused environmental education program that is consistent with the content outlined in *Excellence in Environmental Education— Guidelines for Learning (Pre K–12)* or comparable expectations for adults.
- Design curriculum and instruction to promote the development and use of higher order thinking skills (Bloom's Taxonomy) as appropriate for the audience.

4.7 Flexible and Responsive Instruction
Environmental educators augment proper planning with the flexibility that allows them to take advantage of new instructional opportunities.
For example:
- Modify instructional plans and approaches to take advantage of unexpected opportunities (e.g., new developments in community issues, recent events or phenomena that are in the news or breakthroughs in scientific understanding), to respond to learner questions, interests, and outcomes.
- Blend a variety of instructional methods and activities to meet instructional objectives. Make smooth transitions from one to another.
- Use diverse backgrounds and perspectives as instructional resources.

4.8 Knowledge of Environmental Education Materials and Resources
Environmental educators are aware of a range of materials and resources for their environmental education efforts and understand how to access, evaluate, and use these resources. See http://www.caee.org for an online database/directory of environmental education resources.
For example:
- Identify and evaluate materials and education resources using the Environmental Education Resource Review System or criteria such as those suggested in *Environmental Education Materials: Guidelines for Excellence*.
- Assess the role of partnerships with community members and organizations (e.g., government agencies, businesses, service organizations, the formal and nonformal education systems, and others) to provide environmental education that is appropriate and helpful to the community and to determine ways in which the community may participate in and support instructional programs.
- Use sources of information about instructional materials and other resources, including training offered by national, state and local environmental education programs and professional organizations, such as the Colorado Alliance for Environmental Education (CAEE).

- Use the internet to identify and access sources of information about the environment, particular issues, and educational resources; critically evaluate the usefulness of resources found on the internet.
- Use resources that expose learners to the unique natural and cultural resources found in Colorado, including participants sharing values and knowledge related to the local and regional environment.

4.9 Technologies that Assist Learning

Environmental educators are familiar with a range of technologies available to assist in learning and should be conscious that the use of technology should not replace outdoor experiences.
For example:
- Use a variety of tools and technologies and be able to instruct learners in their safe and proper use.
- Demonstrate proficiency, if appropriate, with computer-based technologies used to display, analyze, and communicate environmental information.
- Identify sources of expertise about unfamiliar learning technologies and learn from these sources or incorporate them into instruction.

4.10 Curriculum Planning

Environmental educators include environmental education in the curriculum.
For example:
- Describe basic approaches to creating a developmentally appropriate scope and sequence for environmental education curricula.
- Develop an environmental education program designed to meet the educational goals of an organization using criteria such as those outlined in *Nonformal Environmental Education: Guidelines for Excellence*.
- Develop a plan for integrating environmental education into the formal school curriculum either across the curriculum, as a separate course, or within one or more areas of study (i.e. math, literacy and language arts, art, social studies, and science).
- Demonstrate links between environmental education curricula and national, state and district standards/curriculum in disciplines such as science, mathematics, social studies, geography and language arts by correlating curriculum with national standards and the Colorado Model Content Standards in particular disciplines or grade levels.

Theme 5 - Assessment and Evaluation

Environmental educators possess the knowledge, abilities and commitment to make assessment and evaluation integral to instruction and programs. Proper preparation should give environmental educators tools for assessing learner progress and evaluating the effectiveness of their instruction.

5.1 Assessment and Evaluation Defined

Environmental educators acknowledge the differences between the terms "assessment" and "evaluation."

- **Assessment** is defined as the process of collecting, synthesizing and interpreting information to determine program effectiveness and aid evaluation.
- **Evaluation** is defined as the process of making a subjective judgment and decision based upon collected information. Tools to use include assessments, participation rates, program cost, etc.

5.2 Learner Outcomes

Environmental educators understand the importance of tying assessment to learning.
For example:

- Identify expected learner outcomes that are tied to the goals and objectives of environmental education.
- Identify Colorado Model Content Standards and local level standards that apply to learner outcomes and be able to link assessment of environmental education to these standards.
- Develop and use a variety of strategies for assessing learner outcomes that reflect both standards and environmental education goals and objectives.

5.3 Assessment that is Part of Instruction

Environmental educators incorporate assessment into environmental education.
For example:

- Develop a needs assessment to identify what instruction is needed and determine the appropriate instructional plan.
- Make objectives and other expectations clear to learners at the outset of instruction.
- Provide examples of and implement specific types of assessment appropriate to environmental education instruction, such as: portfolios, open-ended questioning, oral reports, group or independent research, task or skill demonstration, rubrics.
- Identify and use techniques that assess learner's baseline understandings and skills at the beginning, during, and end of environmental education programs, lessons, units, and other segments of instruction.
- Develop appropriate formative and summative assessment tools for specific environmental education instructional segments or projects.
- Discuss the importance of and identify techniques for encouraging learners to assess their own and others' work and use these assessments as an ongoing part of learning experiences.

5.4 Improving Instruction

Environmental educators use instructional experiences and assessments to improve future instruction.

For example:

- Organize, interpret, and use the results of differing kinds of assessment to help modify and improve future instruction.
- Demonstrate a willingness and ability to collect additional information from and about learners to help modify and improve future instruction.
- Seek out opportunities to reflect, individually and with peers, on their own instructional practices and the broader practice of environmental education within the field.

5.5 Evaluating Programs

Environmental educators understand the importance of evaluating and evaluate environmental education programs.

For example:

- Understand how program evaluation, including needs assessment, formative evaluation, and summative evaluation, contributes to program design and implementation. Utilize existing program evaluation tools, such as the Environmental Education Resource Review System.
- Differentiate among program outputs, outcomes, and impacts and explain how they related to program goals and objectives.
- Describe reasons for evaluating environmental education programs.

Appendix A - Selected References

Selected References:
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Appendix B - Glossary

Advocacy - Persuading or insisting for a particular cause or point of view.

Assessment - The process of collecting, synthesizing, and interpreting information to determine program effectiveness and aid evaluation.

Bloom's Taxonomy - A taxonomic system created by Dr. Benjamin Bloom in 1956 that categorizes the levels of questions asked into various groups, from simple to more complex (knowledge, comprehension, application, analysis, synthesis, evaluation).

Colorado Model Content Standards - Available from the Colorado Department of Education at www.cde.state.co.us.

Concept - A general idea or understanding usually based on common or related characteristics.

Developmentally Appropriate - Designed for a specific grade level or level of knowledge in response to individual differences among learners.

Environmental Educator - Any individual, program, or organization that provides environmental education.

Environmental Issue - The presence of differing perspectives on possible solutions to linked multifactor environmental problems (related yet distinguishable from an environmental problem).

Environmental Literacy - The knowledge and understanding of environmental systems, an understanding of how this knowledge is obtained, skills to apply this knowledge to environmental issues and problems that involve scientific evidence, uncertainty, and economic, aesthetic, and ethical considerations, as well as a sense of personal and civic responsibility.

Environmental Problem - Results from a singular interaction between human activity and the environment (related yet distinguishable from an environmental issue).

Evaluation - The process of making a subjective judgment and decision based upon collected information.

Experiential Learning - Kolb proposes a theory of experiential learning that involves four principal stages: concrete experiences, reflective observation, abstract conceptualization and active experimentation. The 4MAT framework, based on the work of Bernice McCarthy, similarly suggests 4 learning modes (Analytic, Imaginative, Common Sense, and Dynamic) and has been widely applied in education.

Goal - The preferred result from an activity, lesson, or course of study.

Interdisciplinary - Teaching method/strategy that uses more than one discipline to examine a theme or issue.

Learner Outcome - The intended cognitive result of an education program.

Learning Style - The belief that individuals favor particular methods of learning and can optimize their understanding when such methods are available to them within the learning environment. A combination of affective, cognitive, environmental, and physiological responses that characterize how each person learns. Maturation, social transmission and experience are three factors identified by Lawson as necessary parts of learning. Piaget describes four stages of intellectual growth (sensory motor, preoperational, concrete operational and formal operational). Cognitive styles refer to the preferred way an individual processes information and describe a person's typical mode of thinking, remembering, or problem solving. The theory of multiple intelligences suggests that there are a number of distinct forms of intelligence that each individual possesses in varying degrees. Gardner proposes seven primary forms: linguistic, musical, logical-mathematical, spatial, body-kinesthetic, intrapersonal (e.g., insight, metacognition) and interpersonal (e.g., social skills).

Objective - A declaration of a specific measurable or observable outcome preferred from an activity or lesson.

Research - Investigation into a subject in order to discover facts, to establish or revise a theory, or to develop a plan of action based on the facts discovered.

Skill - The ability to identify and execute a resolution to a situation or problem.

Standard - A statement of what a learner should know or be able to accomplish.

Teaching Method/Strategy - A carefully devised plan of action to accomplish a goal or objective.

Appendix C – History of Environmental Education in Colorado
Coming soon…