Guidelines for Excellence

Environmental Educator Knowledge and Skills

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North American Association
for Environmental Education

For more than five decades, the **North American Association for Environmental Education (NAAEE)** has been a leader in promoting excellence in environmental education throughout North America. With members in over 45 countries and affiliations with more than 52 state, regional, and provincial environmental education organizations, NAAEE's influence stretches across North America and worldwide. Our mission is to use the power of education to advance environmental literacy and civic engagement to create a healthier and more sustainable future. We work with educators, policymakers, and partners throughout the world. NAAEE supports the field with various programs and services, including:

Annual Conference and Research Symposium—NAAEE has convened an annual conference for environmental education professionals since 1972. The conference is the largest international gathering of environmental education professionals in North America. It promotes innovation in the field, networking, new tools and resources, and dissemination of research and effective practices.

Resources and eePRO—Through eePRO, our online professional development hub, NAAEE provides its members and supporters with high-quality professional resources at national and international levels, including books, resource guides, essays, peer-reviewed research, best practices, research reviews, job listings, grant opportunities, news across the field, and more.

Professional Development—NAAEE offers unique services in professional development and support. Through online networking and professional learning, training seminars, online learning modules, strategic convening of environmental education leaders, and support of certification programs, NAAEE promotes leadership development and builds the capacity of its members and affiliates.

Policy—NAAEE is a nonpartisan organization that plays a leadership role in raising the profile of environmental education at the state/provincial, regional, national, and international levels. NAAEE works with partners to advocate for environmental education with agencies, organizations, foundations, and others to increase funding and support for the field.

Inspiring Innovation—NAAEE is committed to bringing new voices, ideas, and innovation to the field to broaden environmental education's reach and impact.

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NAAEE is a nonprofit organization dedicated to advancing environmental literacy and civic engagement to create a healthier and more sustainable future for all.

Guidelines for Excellence
Environmental Educator Knowledge and Skills

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Introduction

Introduction

Environmental Educator Knowledge and Skills: Guidelines for Excellence is a comprehensive set of recommendations about the knowledge and skills educators use to provide effective environmental education. The guidelines describe a broad array of environmental educator competencies. However, not all of these competencies are required for every educator.

We use the term environmental educator broadly to include a wide range of individuals who facilitate environmental education experiences in a variety of settings, at a variety of jobs, with a variety of titles. For example, these educators teach in public and private classrooms or lead activities for children and adults at nonformal educational institutions such as nature centers, zoos, aquariums, museums, faith organizations, businesses, community centers, and parks. They may teach at colleges and universities in education, environmental studies, geography, communications, conservation, natural resources, social studies, and science programs. They may develop and implement policies at government agencies, NGOs, and foundations. They may work at libraries and other community organizations. They may teach about and for the environment in spaces like childcare centers, senior living communities, after-school programs, social services, and mental and physical health clinics. They may develop curriculum materials and administer national, state, and local programs. Given this, we will refer to all of these groups as "environmental educators." Regardless of the setting, *Environmental Educator Knowledge and Skills: Guidelines for Excellence* outlines the experiences and learning that will help educators foster environmental literacy, plan environmental education programs, and implement them.

The guidelines are designed for:
- faculty in preservice and in-service education programs who design and teach courses across disciplines and across the human lifespan (from early childhood to older adults)
- environmental educators—from novices to veterans—who want to grow professionally and develop their knowledge and skills
- those who offer professional development or organize professional learning communities for educators who will work in formal, nonformal, and informal educational settings
- educators who don't necessarily have environmental education in their title, but weave it into what they do
- supervisors of those who provide environmental education
- administrators of environmental education certification programs

These guidelines present a comprehensive overview of the knowledge, skills, and abilities—or competencies—of a broad scope of environmental educators. Instead of offering fixed rules, these guidelines suggest a broad vision—a goal to work toward and a guide for personal, professional, and programmatic development.

DID YOU KNOW?

Definitions of Environmental Education, Education for Sustainable Development, and Environmental Literacy

Educating for the environment takes place in a variety of settings and is designed to meet the needs of diverse audiences. Educators identify with a variety of educational fields (e.g., environmental education, education for sustainable development). However, no matter the setting, audience, or field, the same overall goals of fostering civically engaged learners and creating a healthier and more sustainable future are shared.

- **Environmental Education (EE)**
  [EE] *is a process that helps individuals, communities, and organizations learn more about the environment, develop skills to investigate their environment, and make intelligent, informed decisions about how they can help take care of it. It has the power to transform lives and society. It informs and inspires. It motivates action. EE is a key tool in creating healthier and more civically engaged communities.*

North American Association for Environmental Education (NAAEE). About EE and Why it Matters. n.d.
Retrieved from https://naaee.org/about-us/about-ee-and-why-it-matters

- **Education for Sustainable Development (ESD)**
  Education for Sustainable Development (ESD) empowers learners to take informed decisions and make responsible actions for environmental integrity, economic viability, and a just society.

  Education for Sustainable Development is a lifelong learning process and an integral part of quality education. It enhances the cognitive, social, emotional, and behavioral dimensions of learning. It is holistic and transformational and encompasses learning content and outcomes, pedagogy, and the learning environment itself.

  ESD is recognized as a key enabler of all Sustainable Development Goals and achieves its purpose by transforming society.

UNESCO. 2019. "What is Education for Sustainable Development?"
Retreived from https://en.unesco.org/themes/education-sustainable-development/what-is-esd

- **An Environmentally Literate Person**
  [An environmentally literate person] *is someone who, both individually and together with others, makes informed decisions concerning the environment; is willing to act on these decisions to improve the well-being of other individuals, societies, and the global environment; and participates in civic life. Those who are environmentally literate possess, to varying degrees:*
    • *the knowledge and understanding of a wide range of environmental concepts, problems, and issues;*
    • *a set of cognitive and affective dispositions;*
    • *a set of cognitive skills and abilities; and*
    • *the appropriate behavioral strategies to apply such knowledge and understanding in order to make sound and effective decisions in a range of environmental contexts.*

Hollweg, K. S., Taylor, J. R., Bybee, R. W., Marcinkowski, T. J., McBeth, W. C., & Zoido, P. 2011. "Developing a Framework for Assessing Environmental Literacy." Washington, DC: North American Association for Environmental Education. p. 2-3.
Retrieved from https://naaee.org/about/ee/environmental-literacy-framework

How to use the guidelines

Environmental Educator Knowledge and Skills: Guidelines for Excellence is organized around three categories and seven **Key Characteristics**. Each Key Characteristic describes a knowledge or skill area educators need to implement environmental education successfully. Under each Key Characteristic, general **guidelines** further articulate the knowledge and skills necessary to gain competence in that area. Finally, guidelines are accompanied by several more specific **indicators** that suggest what an educator might be doing if they are addressing a particular guideline.

Indicators are simply examples. Indicators should **not** be used as a required checklist; they do not represent a comprehensive listing of learner objectives, abilities, or standards. They do not apply universally to all environmental educators. For example, some indicators may apply best to formal educators. Others may apply only to an educator with years of experience who is honing and deepening their skills.

Guidelines Format

Category

Key Characteristic #1

1.1 Guideline
- Indicator
- Indicator

1.2 Guideline
- Indicator
- Indicator

About the Informational Boxes

Boxes help illustrate the guidelines, tell the stories of programs, and provide additional information, including definitions, explanations, references, and links to websites. There are three types of informational boxes:

DID YOU KNOW?
Background information, definitions, and explanations

GUIDELINES IN PRACTICE
Stories from the field (e.g., short case studies)

RESOURCES YOU CAN USE!
Websites, publications, and tips

About the Supporting Resources

The guidelines are also accompanied by supporting resources that provide further insights. This structure was designed to help educators drill down to the level of specificity that lets them best address their individual needs.

Guidelines at a Glance

This list includes the three organizing categories, seven key characteristics, and related guidelines required for competency in environmental education. Each guideline is further articulated in the sections following this summary.

Content Knowledge & Skills

Environmental educators work actively to develop their environmental literacy.

Key Characteristic #1
Environmental Literacy

Educators understand that becoming environmentally literate is a journey that depends on developing awareness, appreciation, and knowledge of the interrelationships of the natural environment of which we are part. This literacy includes essential skills that enable individuals to make informed decisions and act on those decisions both individually and collectively. Educators understand the importance of the relationships among ecosystem health, community well-being, and long-term sustainability.

1.1 Awareness and appreciation
1.2 Earth processes and systems
1.3 Human systems
1.4 Application of systems thinking
1.5 Action strategies and skills
1.6 Personal and civic responsibility

Foundations, Responsibilities, and Commitments

Environmental educators understand the history, philosophy, ongoing development, professional responsibilities, and commitments of environmental education.

Key Characteristic #2
Foundations of Environmental Education

Educators critically evaluate the goals, theory, practice, and history of environmental education. The results of this evaluation provide a solid foundation on which educators can build their practice.

2.1 Fundamental characteristics and goals of environmental education
2.2 Environmental education practices
2.3 Evolution of environmental education

Key Characteristic #3
Professional Responsibilities of the Environmental Educator

Educators understand and accept the professional responsibilities associated with practicing environmental education. As educators, they maintain consistently high standards for instruction and professional conduct.

3.1 Exemplary environmental education practice
3.2 Environmental information, misinformation, and disinformation
3.3 Facilitation of critical thinking and action skills
3.4 Reflective and reflexive practices
3.5 Ongoing learning and professional development

Key Characteristic #4
Commitment to Community, Collaboration, and Fairness

Educators understand and accept that instruction with a focus on community, collaboration, and fairness is crucial to environmental education.

4.1 Community-centered
4.2 Collaboration and belonging
4.3 Fairness

Design & Implementation

Educators build on their understanding of the history, philosophy, ongoing development, professional responsibilities, and commitments of environmental education to plan and implement high-quality programs.

Key Characteristic #5
Planning Environmental Education

Educators combine the fundamentals of high-quality education with the unique features of environmental education to design effective instruction. Educators plan interdisciplinary, experiential, investigative learning opportunities that are central to environmental education.

5.1 Instructional planning
5.2 Knowledge of learners
5.3 Environmental education materials and resources
5.4 Settings for instruction
5.5 Curriculum and program planning
5.6 Tools and technologies that assist learning

Key Characteristic #6
Implementing Environmental Education

Through their instructional practices, educators create supportive, safe, relevant, and responsive learning environments that are welcoming to the whole learning community. Educators maximize active learning about the environment and environmental concerns. They facilitate the investigation of environmental concerns and exploration of possible solutions and actions in a manner appropriate for their learners, their context, and their community. Educators provide opportunities for action-taking of the learners' choosing.

- 6.1 Instructional methods
- 6.2 Collaborative and welcoming learning environment
- 6.3 Inquiry-based
- 6.4 Exploration of worldviews and perspectives
- 6.5 Promotion of civic engagement and action
- 6.6 Flexible and responsive instruction

Key Characteristic #7
Assessment and Evaluation

Educators possess the knowledge, abilities, and commitment to make assessment and evaluation integral to instruction and programs. Educators are familiar with tools for assessing learner progress and evaluating the effectiveness of their own programs.
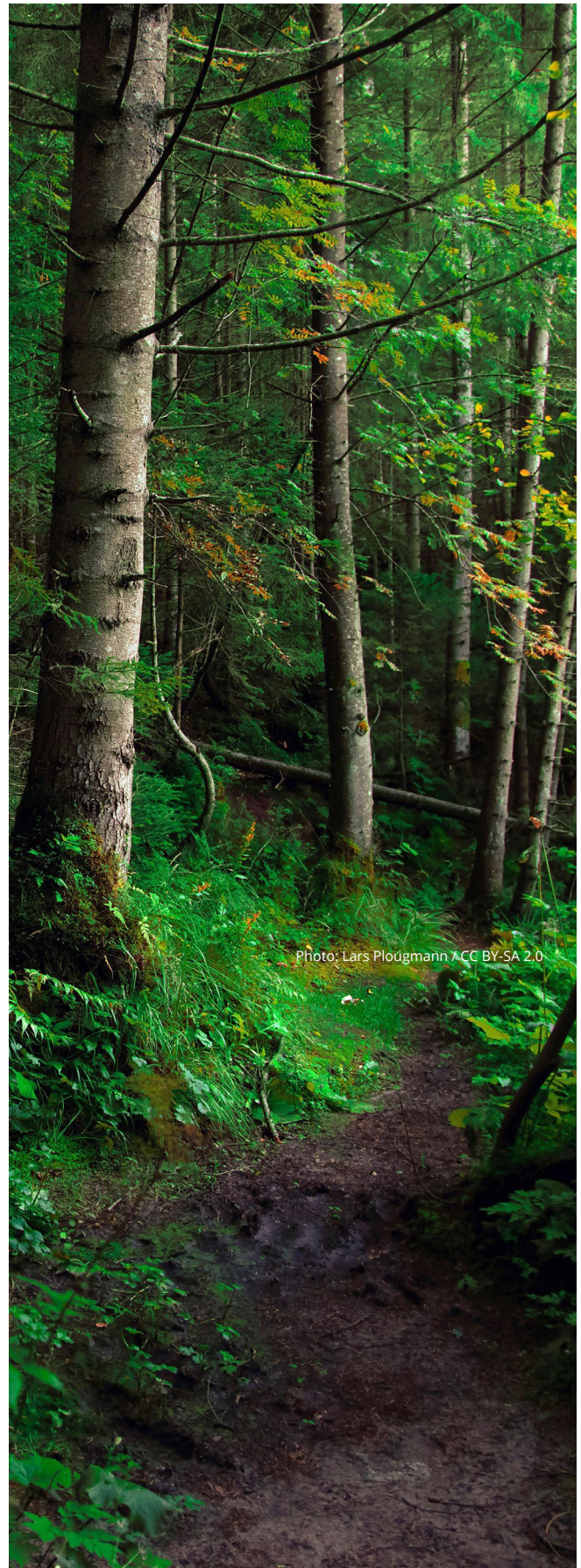
- 7.1 Outcomes: Plan with the end in mind
- 7.2 Learner assessment that is part of instruction
- 7.3 Program evaluation
- 7.4 Improving instruction, program design, and materials

Photo: Lars Plougmann / CC BY-SA 2.0

Essential Underpinnings of Environmental Education

Environmental education builds from core principles that inform its approach to learning:

Human Well-Being: Human well-being is inextricably bound with environmental quality and planetary well-being—the overall health of Earth systems. Humans are a part of the natural order. Humans, and the systems they create—societies, political systems, economies, religions, cultures, technologies—impact the total environment and are impacted by the environment. Since humans are a part of nature rather than outside it, they are challenged to recognize the ramifications of their interdependence with Earth systems.

Importance of Where One Lives: Beginning close to home, learners connect with, explore, and understand their immediate surroundings. They appreciate nature around them, wherever they live. The self-awareness, knowledge, and skills needed for this local connection to both the natural and built environments provide a base for moving into larger systems, broader issues, and an expanding understanding of connections and consequences.

Integration and Infusion: Knowledge and skills drawn from the natural sciences, social sciences, and humanities are interconnected through the environment and environmental issues. Environmental education offers opportunities to integrate discipline-based learning, fostering a deeper understanding of concepts and skills.

Collaborative, Welcoming, and Responsive: Environmental education instruction is welcoming and respectful to all learners. EE actively works to create learning opportunities that promote the dignity and worth of all people.

Lifelong Learning: Critical and creative thinking, decision-making, communication, and collaborative learning, are emphasized. Development and ongoing use of a broad range of skills and practices are essential for active and meaningful learning, both in school and over a lifetime.

Roots in the Real World: Learners develop knowledge and skills through direct experience with their community, the environment, current environmental issues, and society. Investigation, analysis, and problem solving are essential activities and are most effective when relevant to learners' lives and rooted in their experiences.

Sustainable Future: Embracing the United Nations Sustainable Development Goals and the Greening Education Partnership, learning reflects on the past, examines the present, and is oriented to the future. Learning focuses on environmental, social, and economic responsibility as drivers of individual and collective choices.

Systems and Systems Thinking: Systems thinking helps make sense of a large and complex world. A system is made up of parts. Each part can be understood separately. The whole, however, is understood only by examining the relationships and interactions among the parts. Earth is a complex system of interacting physical, chemical, and biological processes. Organizations, individual cells, communities of animals and plants, and families can all be understood as systems. And systems can be nested within other systems.

DID YOU KNOW?

Sustainable Development Goals

At the core of the 2030 Agenda for Sustainable Development, adopted by world leaders, are 17 Sustainable Development Goals (SDGs) that call on all countries to mobilize efforts to:

...secure a sustainable, peaceful, prosperous, and equitable life on earth for everyone now and in the future. The goals cover global challenges that are crucial for the survival of humanity. They set environmental limits and critical thresholds for the use of natural resources. The goals recognize that ending poverty must go hand-in-hand with strategies that build economic development. They address a range of social needs including education, health, social protection, and job opportunities while tackling climate change and environmental protection. The SDGs address key systemic barriers to sustainable development, such as inequality, unsustainable consumption patterns, weak institutional capacity, and environmental degradation.

Environmental education works towards a sustainable future for all, where environmental and social responsibility drives individual and institutional choices.

Source: United Nations. 2015. "Transforming Our World: The 2030 Agenda for Sustainable Development." Retrieved from https://sustainabledevelopment. un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20 Development%20web.pdf

The Instructional Vision of Environmental Education

These guidelines outline the knowledge and skills an educator needs to implement environmental education successfully. Environmental education is a comprehensive and cohesive whole that draws on and advances broad educational goals and instructional methods. Taken by themselves, these competencies may not capture all of this rich vision.

Environmental education is, at its heart, an integrative undertaking. Educators teach across disciplines, linking the methods and content of natural and social sciences, mathematics, and humanities to help learners fully understand and address complex environmental issues. Educators need the ability and the commitment to keep the whole picture in mind as they guide learners toward environmental literacy.

The learner is an active participant in environmental education. If learning is to become a motivating and valued part of life outside of planned learning experiences, instruction should engage the learner in the process of building knowledge and skills and be guided in part by the individual's interests.

Environmental issues are complex and multifaceted. Especially because these issues can prompt deep feelings and strong opinions, educators must consider differing perspectives and points of view and present information with intellectual honesty. They involve learners in critically evaluating data, results, models, conclusions, and opinions. Accuracy is consistently reviewed.

Environmental educators work in formal and nonformal settings and with learners of all ages. Educators foster learners' innate curiosity and enthusiasm, providing them with early and continuing opportunities to explore their natural environment. Experiences outdoors are an important instructional strategy that can be used for engaging learners in direct discovery of the world around them. This awareness of their local community can prompt a personal commitment to apply skills and knowledge to pursue environmental quality and quality of life.

Finally, environmental education provides opportunities for learners to enhance their capacity for independent thinking and taking effective, responsible action. Engaging in individual and group experiences helps learners develop these capacities independently and in collaborative situations that anticipate how problem-solving happens in the community, on the job, and in the family. A strong emphasis on developing communication skills helps learners demonstrate and disseminate their knowledge.

RESOURCES YOU CAN USE

Greening Education Partnership

The Greening Education Partnership (GEP) is a global initiative that takes a whole-of-system approach...
As a collaborative platform for governments and other stakeholders, including intergovernmental organizations, civil society, youth, academia, and the private sector, Greening Education Partnership aims to deliver strong, coordinated, and comprehensive action that will prepare every learner to acquire the knowledge, skills, values, and attitudes to promote sustainable development.

The Greening Education Partnership is focused on four key areas:

- **Greening schools**
- **Greening every curriculum**
- **Greening teacher training and education system capacities**
- **Greening communities**

Source: UNESCO. 2024. "Greening Education Partnership." Retrieved from https://www.unesco.org/en/sustainable-development/education/greening-future

Content Knowledge & Skills

Environmental educators work actively to develop their environmental literacy.

Key Characteristic #1:

Environmental Literacy

Key Characteristic #1

Environmental Literacy

Educators understand that becoming environmentally literate is a journey that depends on developing awareness, appreciation, and knowledge of the interrelationships of the natural environment of which we are part. This literacy includes essential skills that enable individuals to make informed decisions and act on those decisions both individually and collectively. Educators understand the importance of the relationships among ecosystem health, community well-being, and long-term sustainability.

- See Resource #1, page 90, for a listing of documents that articulate environmental literacy competencies. Each provides a roadmap that environmental educators can use to navigate their pathway toward the development of their environmental literacy.

1.1 Awareness and appreciation

Educators build an appreciation that Earth is one living, dynamic community.

- Develop an awareness of nature, environmental interrelationships, and the interdependence of all life forms, including humans.
- Understand the reciprocal relationships between people and nature. Explain how people and nature can benefit from each other through actions and interactions.
- Recognize the positive cognitive, physical, and emotional effects of spending time in nature.
- Acknowledge that concerns about the environment can surface emotions and lead to anxiety, grief, and guilt.
- Cultivate meaningful relationships with nature, other educators, learners, and community members.

RESOURCES YOU CAN USE

The Benefits of Nature Toolkit

The Children and Nature Network has recently published a toolkit designed to help educators access research focused on the benefits of spending time in nature.

The toolkit includes evidence-based talking points that cover the following sections:

- **Nature makes kids healthier**: healthier birth outcomes; higher levels of physical activity and healthier weight; stronger immune function and reduced nearsightedness.
- **Nature makes kids happier**: more positive moods; better resilience and improved ability to deal with stress; higher self-esteem.
- **Nature makes kids smarter**: improved focus, reduced stress, better learning and information retention.
- **Nature helps kids care about the environment.**

Each topic links to a short overview, a list of research-based talking points, an infographic that illustrates the research results, and research digests that compile relevant research literature.

Access the Children and Nature Network "Benefits of Nature Toolkit" by visiting: https://www.childrenandnature.org/the-benefits-of-nature/

Children & Nature Network

1.2 Earth processes and systems

Educators develop an understanding of Earth processes and systems (e.g., atmosphere, hydrosphere, geosphere, and biosphere) and how these systems interact with one another.

- Explain major interactions among organisms and populations of organisms and the importance of biodiversity to ecosystem health.
- Describe how human sustainability depends on Earth systems and investigate how changes in Earth systems affect human communities.
- Explain how changes in one Earth system result in changes to another.
- Identify and access current information about Earth systems and project future scenarios using various sources and ways of knowing, including peer-reviewed science articles, knowledgeable adults or peers, Indigenous Knowledge Systems, and local knowledge.
- Illustrate the interactions among land, ocean, and atmospheric cycles.
- Describe how living things, including humans, are dependent on their environment and are adapted to live in particular ecosystems under particular environmental conditions.

1.3 Human systems

Educators develop an understanding of human systems (e.g., social, economic, political, and cultural) and how individual and group action affects the long-term sustainability of Earth systems.

- Analyze historical, ethical, cultural, geographic, economic, and sociopolitical relationships to understand environmental impacts.
- Examine how environmental impacts are unevenly distributed across communities, regions, and the world.
- Apply research and analytical skills to describe how human consumption and the use of technology affect environmental health, the capacity to be self-sustaining, and natural systems.
- Analyze differing beliefs and values within the same community and the larger society and consider how sustainable solutions rely on reconciling varied perspectives.
- Research an example of individuals or groups working to address local, regional, or global environmental problems; describe the context and relevant dynamics (e.g., among community members, political parties, interest groups, and the media).
- Identify and describe barriers to environmental actions and how they can be addressed (e.g., policies in schools, local and national governments, and organizations).

DID YOU KNOW?
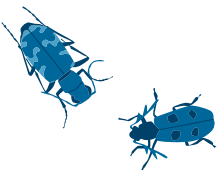
Ways of Knowing

How do we develop our understanding of the world around us? How is our worldview shaped? What's the role of culture and experience? These questions (and many more) delve into ways of knowing—"the tools we use to gather, create, represent and pass on knowledge."[1] As we think about teaching others about the environment, considering our ways of knowing becomes increasingly important.

Although there are many ways of knowing, two are particularly relevant: Science as a Way of Knowing and Indigenous Knowledge Systems.

Science as a Way of Knowing

Understanding the nature of science has shifted considerably in the last several years, away from a more linear notion exemplified by the scientific method, to one that embraces science as a way of knowing. The National Research Council's Framework for K–12 Science Education elaborates on this:

> *Scientific knowledge is a particular kind of knowledge with its own sources, justifications, ways of dealing with uncertainties, and agreed-on levels of certainty. When students understand how scientific knowledge is developed over systematic observations across multiple investigations, how it is justified and critiqued on the basis of evidence, and how it is validated by the larger scientific community, the students then recognize that science entails the search for core explanatory constructs and the connections between them. They come to appreciate that alternative interpretations of scientific evidence can occur, that such interpretations must be carefully scrutinized, and that the plausibility of the supporting evidence must be considered. Thus, students ultimately understand, regarding both their own work and the historical record, that predictions or explanations can be revised on the basis of seeing new evidence or of developing a new model that accounts for the existing evidence better than previous models did.*

Source: National Research Council. 2012. "A Framework for K–12 Science Education: Practices, crosscutting concepts, and core ideas." Retrieved from https://www.nextgenscience.org/sites/default/files/resource/files/Appendix%20H%20-%20 The%20Nature%20of%20Science%20in%20the%20Next%20Generation%20Science%20Standards%204.15.13.pdf

[1] International Baccalaureate Organization. *Ways of Knowing.* n.d.
   Retrieved from http://sohowdoweknow.weebly.com/ways-of-knowing.html

DID YOU KNOW?

Ways of Knowing

Indigenous Knowledge Systems

Indigenous Knowledge Systems, also sometimes known as Traditional Ecological Knowledge (TEK), Local Knowledge, and Indigenous Ecological Knowledge, provide a deep understanding of the natural world that has been developed over generations. The Arctic Council Indigenous Peoples' Secretariat describes Indigenous Knowledge Systems as:

> *... a systematic way of thinking and knowing that is elaborated and applied to phenomena across biological, physical, cultural, and linguistic systems. Traditional Knowledge is owned by the holders of that knowledge, often collectively, and is uniquely expressed and transmitted through Indigenous languages. It is a body of knowledge generated through cultural practices, lived experiences including extensive and multigenerational observations, lessons, and skills. It has been developed and verified over millennia and is still developing in a living process, including knowledge acquired today and in the future, and it is passed on from generation to generation.*

Source: Arctic Council. 2015. "Ottawa Traditional Knowledge Principles." Retrieved from https://www.arcticpeoples.com/knowledge#indigenous-knowledge

Overlapping Qualities of Indigenous Knowledge Systems and Science as a Way of Knowing

Distinctions exist between science and Indigenous Knowledge Systems. However, they have also been described as overlapping domains, with common ground that includes habits of mind (e.g., perseverance and open-mindedness), skills and procedures related to observation and pattern recognition, and knowledge (e.g., plant and animal behavior, cycles, habitat needs).

Acknowledging both the distinctions and commonalities in these ways of knowing, scientists and Indigenous people are increasingly working together to monitor biodiversity loss, make resource management decisions, and address other sustainability issues.

Selected resources:

• Andersen, D. 2021. "What Are Indigenous Knowledge Systems?" Retrieved from https://www.tvo.org/article/what-are-indigenous-knowledge-systems-and-how-can-they-help-fight-climate-change
• International Baccalaureate Organization. n.d. "Ways of Knowing."
  Retrieved from http://sohowdoweknow.weebly.com/ways-of-knowing.html
• NSTA. 2020. "Position Statement: The Nature of Science." Retrieved from https://www.nsta.org/nstas-official-positions/nature-science

1.4 Application of systems thinking

Educators apply systems thinking to understand how human activities cause and mitigate environmental change and how environmental change affects long-term environmental sustainability at varying, interconnected levels (e.g., local, state/provincial, regional, tribal, national, and global).

- Analyze the interrelationships among the causes, impacts, and possible solutions of environmental concerns.
- Consider the implications of systems interactions among humans, other living organisms, the physical environment, and the built or designed environment.
- Investigate the connection between human health and the health of the environment at the individual, family, and community levels using various sources and ways of knowing.
- Identify the effects of human choices on environmental concerns at varying, interconnected levels (e.g., local, tribal, state/provincial, regional, national, and global).
- Recognize that many solutions to environmental concerns can also solve other community challenges, and working toward change can build alliances across many interests.

DID YOU KNOW?

Systems Thinking

Systems thinking[1] is key to environmental literacy. It is a cross-disciplinary approach to understanding how to think better about real-world systems and the real-world issues we face. By understanding the environment as a complex system of interconnected parts, we can identify root causes and find solutions that work for the whole system.

Some key principles of systems thinking include:

- **A system is more than the sum of its parts.** A system is not just the individual components that make it up. It is also the relationships between those components.
- **Systems are complex and dynamic.** Systems are constantly changing and evolving. They are affected by internal and external factors.
- **Systems have feedback loops.** Feedback loops are the interactions between different parts of a system—the relationships between its inputs and outputs. These feedback loops can be positive or negative.
- **Systems have boundaries.** Systems thinking considers the boundaries of the system under study and its relationship with the external environment. Both internal and external factors can influence the behavior of the system.
- **Systems can be modeled.** We can represent systems using models that help us better understand them.

These four cognitive skills, or simple rules, underlie even the most complex forms of thinking:[2]

1. Distinctions Rule: Any idea can be distinguished from other ideas.
2. Systems Rule: Any idea can be split into parts or lumped into a whole.
3. Relationships Rule: Any idea can relate to other ideas.
4. Perspectives Rule: Any idea can be the point of view of a perspective.

Using these skills, individuals evaluate and reflect on how to establish meaning and build knowledge—the mental models used daily to navigate the real world. By applying systems thinking, individuals better understand the complexities of environmental challenges and develop more effective, sustainable, and lasting solutions. Systems thinking can address these challenges by:

- Identifying root causes
- Considering unintended consequences
- Identifying leverage points
- Adapting and learning
- Building resilience

[1] For an introduction to systems thinking that includes easy to understand examples, review *An Introduction to Systems Thinking* (original works by Draper L. Kauffman, Jr. and Donna Meadows, adapted by Andra Yeghoian). Retrieved from https://docs.google.com/document/d/1BuF9dEbNXfdYEg_BaDHVq-HGVzXCfhZPQQ0eLQjk5ok/edit

[2] Cabrera, D. and L. Cabrera. 2015. *Systems Thinking Made Simple: New Hope for Solving Wicked Problems in a Complex World.* Ithaca: Odyssean Press.

1.5 Action strategies and skills

Educators apply skills for analyzing and investigating environmental concerns.

- Apply research and analytical skills to systematically investigate environmental issues ranging from local concerns to those that are regional or global in scope.
- Investigate the consequences of a broad range of environmental changes, conditions, and issues on environmental quality and long-term sustainability.
- Examine the environmental, social, and economic contexts that shape an issue and possible courses of action. Consider whether the issue advantages or disadvantages one group of people more than another.
- Evaluate whether personal or group action is warranted in specific situations, accounting for availability of evidence about the issue and proposed solutions; the scale of the issue; legal, social, political, economic, and ecological consequences; and alternatives to civic action.
- Evaluate, justify, and communicate your views on environmental issues and possible ways to address them. Understand a broad range of environmental action strategies.
- Create action plans based on an understanding of the complexity of the issue. Decide whether the action plans or design solutions should be implemented immediately or in the future, modified, or abandoned. Carry through with action as appropriate.
- Develop personal skills in communication, collaboration, and leadership needed to work collectively toward solutions.

1.6 Personal and civic responsibility

Educators build an understanding that everyone, individually and collectively, can make a difference and contribute to environmental solutions.

- Exhibit personal agency by working independently and making choices to bring about environmental solutions.
- Demonstrate a willingness and ability to act on your conclusions about what should be done to work toward environmental quality.
- Describe the relationship between exercising individual rights and responsibilities and addressing environmental quality and long-term sustainability.
- Explain the importance and evaluate the usefulness of civic principles such as trust, patience, self-discipline, acceptance, civility, respect, adherence to law, standing up for the rights of others, and open-mindedness to environmental action.
- Contribute to a more resilient and adaptable society by cultivating dispositions such as collaboration, accountability, perseverance, and critical thinking.
- Describe ways in which the decisions of one generation create opportunities and impose constraints for future generations.
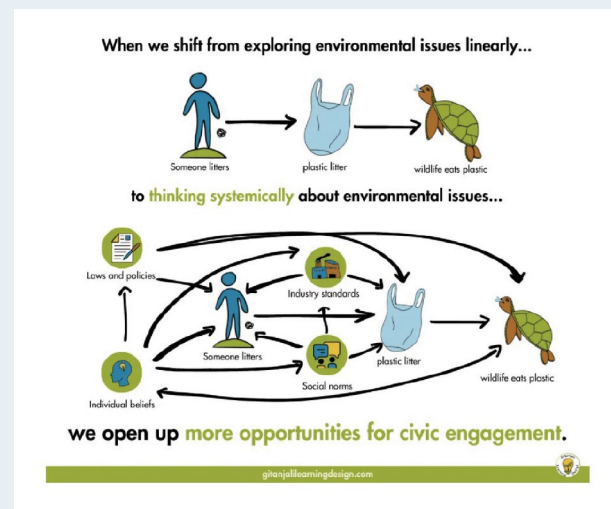
GUIDELINES IN PRACTICE

Leveraging Systems Thinking to Further Civic Engagement for Sustainability

Today's youth are inundated with a torrent of systemic problems. As educators who want to engage youth in learning and action on pressing environmental challenges, how do we inspire a generation of knowledgeable, motivated, and civically engaged youth? This challenge was at the forefront of my mind when I started my career as a high school geography and history teacher. While learning from the past and making sense of the present, I wondered how I could help my students understand the complex issues and engage them in making a difference in our community. One of the most powerful resources I gained was a systems thinking practice.

Systems thinking is a way of looking at the world that explores the dynamic interrelationships of the elements around us. It can be a valuable lens for helping students make sense of complexity—one of the 17 essential sustainability competencies young people need to achieve the UN Sustainable Development Goals, according to the team at the World's Largest Lesson. This is one of the many reasons systems thinking can be an asset to engaging youth in environmental education and action. When students learn to make sense of the complex world around them and contextualize themselves in a system, they realize they can impact the world, not just be impacted by it. This helps students develop the knowledge, skills, and mindsets necessary to move away from apathy and eco-anxiety towards agency and hope.[1]

When we explore environmental issues with students, it can be tempting to approach problems linearly. If we see trash in the park, it's because someone littered it. If we see plastic in the ocean, it's because we use too much plastic. These types of "cause" and "effect" statements are true, but they're also remarkably oversimplified. To make systems change, we must teach them to look beyond cause and effect to the systemic origins of environmental problems. This deeper reflection enables them to engage in more impactful civic action.

[1] World's Largest Lesson. New Report: Sustainability Competencies. n.d. Retrieved from https://worldslargestlesson. globalgoals.org/campaign/sustainability-competencies/

GUIDELINES IN PRACTICE

Leveraging Systems Thinking to Further Civic Engagement for Sustainability

To make systems change, we must teach systems thinking. To teach systems thinking, we need tools that help engage students in meaningful civic action to address environmental issues. Examples include the Sustainability Compass,[2] from the nonprofit Compass Education, which helps users make sustainable actions and decisions by reminding them to consider their actions through the lens of N (nature), E (economy), S (society), and individual W (wellbeing). The Systems Iceberg[3] helps students dive deeper into the patterns and structures that lead to the events and problems they want to change. It also helps them surface underlying mindsets and beliefs that inform our society and behaviors. Tools like causal loop diagrams[4] help students make sense of the relationships in the world around them and tell compelling stories about how change is possible. These tools and more can help students visualize and engage with complex issues to identify their opportunities to make change.

Recognizing interdependence and dynamic relationships helps students understand how their actions can impact the systems around them. This allows them to practice anticipating the effects of their action plans to mitigate possible negative externalities so they can do the most good and the least harm. It also teaches the student to find leverage points—places in a system where they can maximize the impact of our limited time, energy, and resources by targeting them with our civic action. They can help students discover the depth of their influence and autonomy so they can focus their energy on a specific goal and targets.

Inspiring and empowering students to engage in civic education too is essential to addressing environmental issues. But it's not just students who need systems thinking training and tools. It's us—educators. Whether we work in the classroom, community centers, museums, or the great outdoors, we are connected to dozens, if not hundreds, of students each year. That means if we develop and practice systems thinking in how we approach and teach about environmental issues, we can have an even more significant impact on cultivating a generation of empowered, engaged individuals. Systems thinking can help us develop our own leadership as environmental educators and reassert our agency as civically engaged human beings.

Written by Gitanjali Paul, Gitanjali Learning Design LLC

[2] Compass Education. The Sustainability Compass. n.d.
Retrieved from https://www.youtube.com/watch?v=pBByS6uHBzk
[3] Compass Education. The Systems Iceberg Explained. n.d.
Retrieved from https://www.youtube.com/watch?v=y6h2_EcOOcM
[4] Lannon, C. Causal Loop Construction: The Basics. Systems Thinking. 2018.
Retrieved from https://thesystemsthinker.com/causal-loop-construction-the-basics/
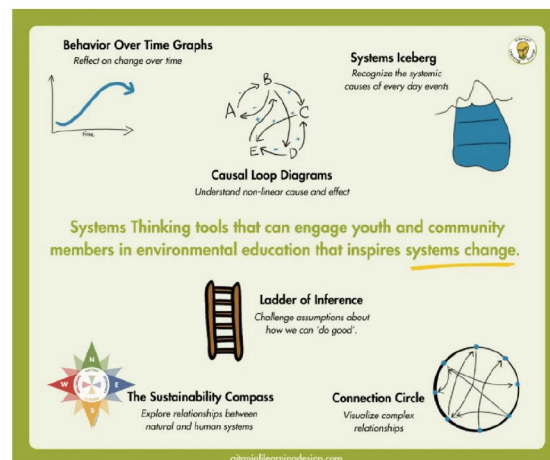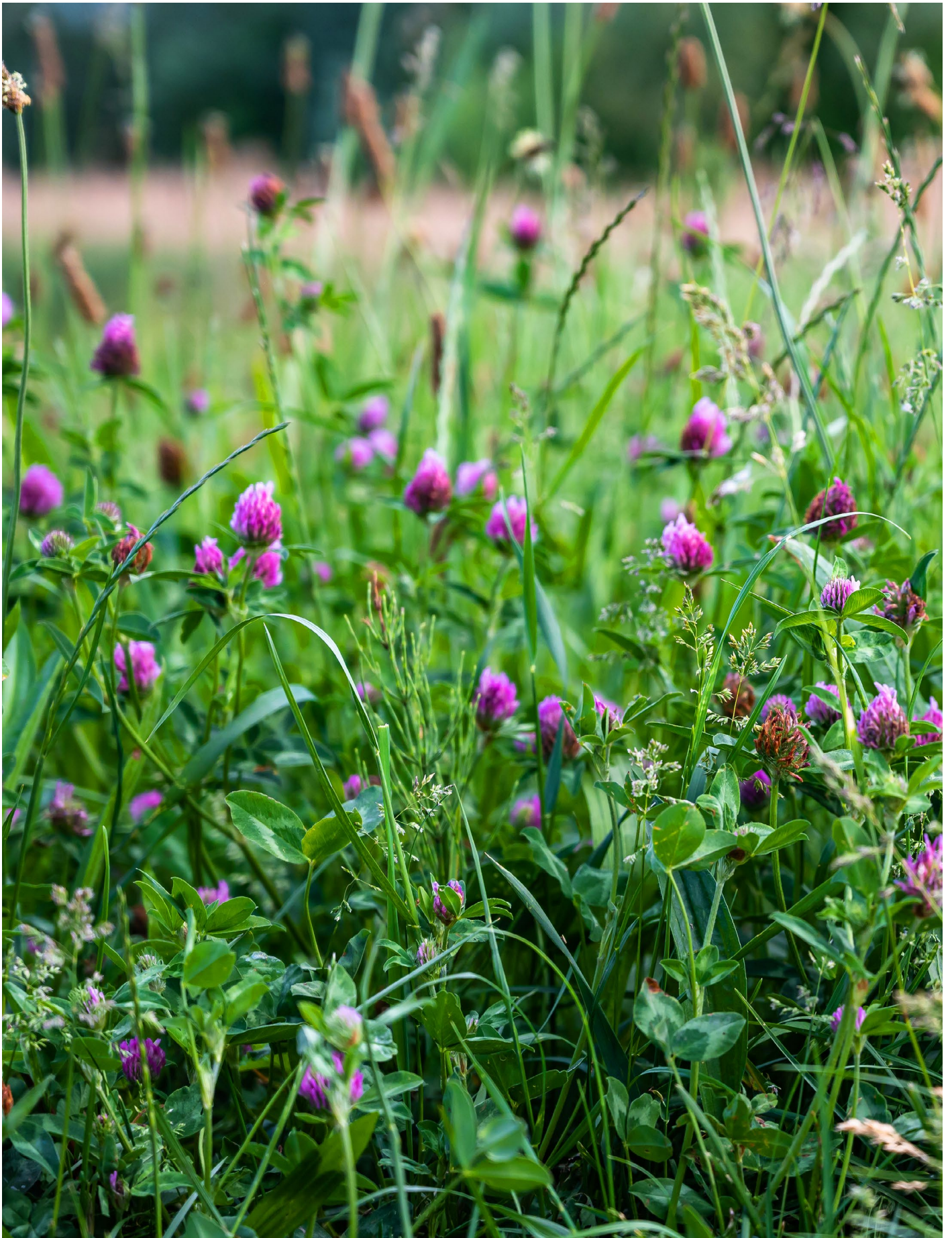
Foundations, Responsibilities, and Commitments

Environmental educators understand the history, philosophy, ongoing development, professional responsibilities, and commitments of environmental education.

Key Characteristic #2:

Foundations of Environmental Education

Key Characteristic #2

Foundations of Environmental Education

Educators critically evaluate the goals, theory, practice, and history of environmental education. The results of this evaluation provide a solid foundation on which educators can build their practice.

2.1 Fundamental characteristics and goals of environmental education

Educators describe environmental education as a distinct field and analyze its defining characteristics and goals.

- Critique the goals and objectives of environmental education, including those laid out in founding documents of the field such as the Belgrade Charter (UNESCO-UNEP, 1976), Tbilisi Declaration (UNESCO, 1978), and Agenda 21 (UNCED, 1992).
- Consider the degree to which environmental education crosses and blends traditional academic disciplines.
- Describe and illustrate the major components of environmental literacy. Discuss influences that contribute to this evolution by a range of authors and thinkers from various perspectives.
- Relate environmental education's focus on environmental literacy and civic engagement to providing opportunities for learners to connect with nature, develop independent thinking, and take effective, responsible action.

GUIDELINES IN PRACTICE

Gaia Scholastic

Gaia Scholastic is a consulting company that supports educational organizations in integrating standards-driven, interdisciplinary environmental literacy into K–12 classrooms across content areas. Building environmental literacy into different subjects allows students to explore nature from multiple perspectives; this an be achieved through simple entry points:

- **Science**: energy, ecosystems, and resource management
- **Math**: data analysis, measurement, and spatial relationships related to environmental issues
- **English Language Arts**: research, critical thinking, and communication skill development, exploring environmental literature, and advocating for sustainability
- **Social Studies**: historical, political, and economic relationships with the environment; civic action

This interdisciplinary approach helps students gain a holistic understanding of environmental issues and their role in addressing them.

Gaia Scholastic's Civic Seal is an interdisciplinary environmental education project that brings learning beyond the classroom. Designed for social studies and aligned with New York State's Middle School Seal of Civic Readiness, this project inspires students to take civic action through the lens of the UN Sustainable Development Goals (SDGs). Meeting weekly over the course of a semester (teachers can adjust the time frame needed), students use the SDGs to explore global, national, and local issues such as food insecurity, mental health, renewable energy, and more. The SDGs are an accessible language Gaia Scholastic uses with students starting at the elementary level. The SDGs support students in understanding what problems exist worldwide. Through the scaffolded nature of this project, students translate these global issues into a local context and integrate community-based solutions.

Student Solutions Through Interdisciplinary Approaches:

- **Bird Collisions: Science, ELA, & Social Studies**
  Through Gaia's Civic Seal project, one student identified bird collisions as a major problem. She contacted her local Audubon branch and learned that birds can only see specific wavelengths of color, which causes their collisions with windows. She brought her project to the local Farmers Market to educate others about bird collisions and to raise money to buy bird dots for commercial and residential windows. These dots help to prevent collisions. She raised over $450, enough to provide more than 1,000 community members with free bird dots to use in their homes and businesses. She trained all users on how to apply the bird dots to their windows and why they matter. She was so inspired by the work, she's continuing to expand the project.
- **Upcycled Art: Science, Art, Social Studies, & ELA**
  Another student partnered with a community clean-up event to transform pollution into art. She transformed the trash collected from the clean-up into an art installation of a sturgeon, a local fish species endangered as a result of human-wildlife relations. The subject of her piece was particularly striking, as the sturgeon were constructed from the very trash threatening their livelihood in the Hudson River. She showcased her work to the public both through a keynote presentation and a booth at a 2024 Gaia Scholastic Youth Climate Summit.[1] Her piece later became a permanent installation at her school district. She even shared her work directly with New York State Senator Pete Harckham and Assemblywoman Dana Levenberg!

[1] For more information about the Climate Summit, visit:
https://www.gaiascholastic.com/standards-based-environmental-education/youth-climate-summits

GUIDELINES IN PRACTICE

Gaia Scholastic

Gaia's Civic Seal project challenges students to conduct research by evaluating reliable sources and developing action plans in partnership with local organizations. Through this partnership, students create real-world solutions to issues they're passionate about. They communicate their findings through creative outlets like podcasts, petitions, fundraisers, and community events. This project fosters global literacy, encourages student-led solutions, and provides valuable civic experience by enabling students to make a tangible difference in their communities and beyond.

Written by Rachel Arbor, Founder & CEO of Gaia Scholastic. For more information about Gaia Scholastic Consulting Services, visit: https://sites.google.com/view/gaiascholastic/gaia-scholastic

2.2 Environmental education practices

Educators understand that environmental education takes place in a variety of settings and that sources of support, program requirements, and other factors vary from context to context.

- Compare and contrast learning environments (e.g., indoor classrooms, outdoor classrooms, virtual classrooms, parks and other natural areas, museums, zoos, aquariums, community centers). Reflect on how the characteristics of a learning setting can facilitate and/or limit learning. For example, consider that some individuals or groups may not feel welcome or comfortable in all settings.
- Identify a range of individuals, organizations, and agencies offering environmental education programs, including formal and nonformal programs.
- Discuss how local norms, cultures, school policies, state/provincial mandates for environmental education, and federal legislation influence environmental education efforts.
- Describe a variety of national, tribal, regional, state/provincial, and local environmental education programs and support services, including funding sources and resources.

2.3 Evolution of environmental education

Educators are familiar with how the field of environmental education has changed over time and continues to change. They analyze how major educational movements contribute to the development of environmental education and how they differ from and are interconnected with environmental education.

- Describe the role of landmark events—from the Brundtland Commission (1987) and the United Nations Conference on Environment and Development (1992) to the World Summit on Sustainable Development (2002) and the UNESCO World Conference for Sustainable Development (2021)—and how they have influenced—or might influence—environmental education.
- Compare other educational movements (e.g., land-based education, progressive education, early childhood education, nature study, outdoor education, conservation education, place-based education, experiential education, and education for sustainable development) to environmental education.
- Critically evaluate findings from environmental education research and discuss their effect on how environmental education might be perceived, defined, or practiced, including how research can inform one's own practice.
- Identify current and emerging issues in the field of environmental education. For example, evaluate assertions that environmental education focuses more on political advocacy rather than education and discuss how these assertions are affecting environmental educators and education programs.
- Analyze the social, political, and economic dynamics that affect environmental education opportunities for communities. For example, consider how opportunities may differ across rural, suburban, and urban communities.
- Explore global perspectives and the work of international agencies related to the ongoing development of environmental education.

DID YOU KNOW?

Environmental Education: A Vision for the Future

These guidelines are grounded in a common understanding of effective environmental education. For many environmental educators, that understanding is rooted in two founding documents of the field: the Belgrade Charter (UNESCO-UNEP, 1975) and the Tbilisi Declaration (UNESCO, 1977).

The Belgrade Charter[1] was adopted by a United Nations conference 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 solutions of current problems and the prevention of new ones.

Two years later, at the world's first intergovernmental conference on environmental education, the Tbilisi Declaration[2] was adopted. This declaration was built on the Belgrade Charter and established three broad goals for environmental education. These goals provide the foundation for much of what has been done in the field since 1977:

- 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 toward the environment

As the field has evolved, these principles 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 of environmental literacy. Since 1978, bodies such as the Brundtland Commission (1987), United Nations Conference on Environment and Development in Rio (1992), World Summit on Sustainable Development in Johannesburg (2002), United National Decade of Education for Sustainable Development (2005-2014), UNESCO Global Action Programme on Education for Sustainable Development (2014), UNESCO World Conference on Education for Sustainable Development (2021), and United Nations Climate and SDG Synergy Conference (2024) have influenced the work of many environmental educators. By highlighting the importance of viewing the environment within the context of human influences, this perspective has expanded the emphasis of environmental education.

See Resource #2, page 93, for more information about the history and philosophy of environmental education, including founding documents of environmental education (Stockholm Declaration, Belgrade Charter, and Tbilisi Declaration) and other key international conferences and reports.

[1] UNESCO. 1975. *The Belgrade Charter: A Framework for Environmental Education.* Retrieved from https://www.eusteps.eu/wp-content/uploads/2020/12/Belgrade-Charter.pdf
[2] UNESCO. 1978. *Intergovernmental Conference on Environmental Education: Final Report.* Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000032763

• See Resource #4, page 101, to read comprehensive research reviews that demonstrate the impact and value of environmental education.
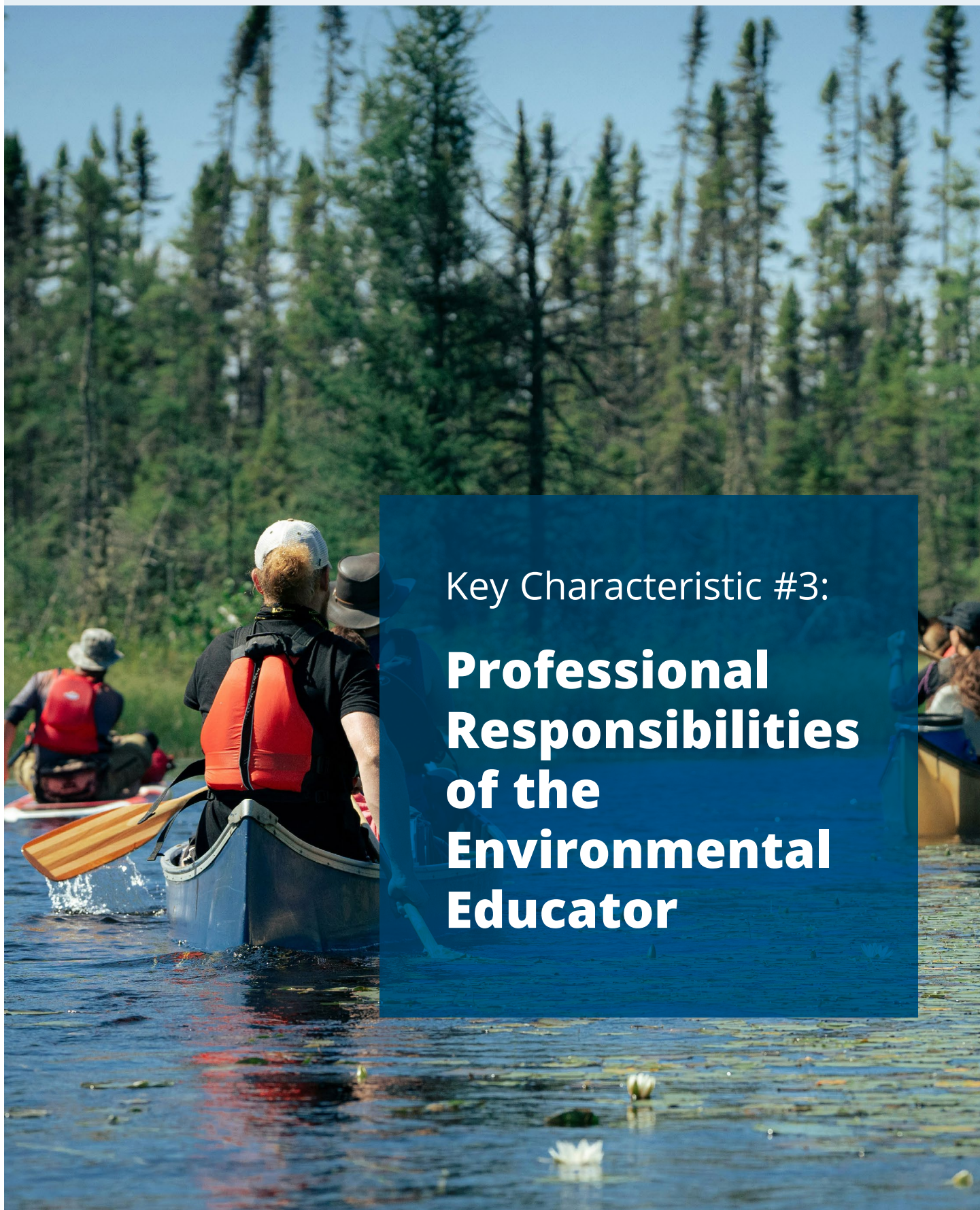
Key Characteristic #3:

Professional Responsibilities of the Environmental Educator

Key Characteristic #3

Professional Responsibilities of the Environmental Educator

Educators understand and accept the professional responsibilities associated with practicing environmental education. They maintain consistently high standards for instruction and professional conduct.

3.1 Exemplary environmental education practice

Educators understand their responsibilities and know how to provide environmental education that is relevant, constructive, and aligned with the standards of the field.

- Describe ways in which environmental education can enhance the development of all learners.
- Evaluate the role of partnerships with community members and organizations, government agencies, businesses, formal and nonformal education systems, and others in providing environmental education that is relevant and integrates with the community.
- Identify ways of creating safe and welcoming learning environments that encourage thoughtful dialogue and multiple perspectives. Understand and be respectful of differing values and belief systems.
- Describe the steps needed to create physically and psychologically safe spaces for participants.
- Identify ways an educator can model the process of inquiry and application of environmental investigations in instruction.
- Discuss, identify, and practice ways in which environmental education can be used as a tool for meeting applicable academic standards and addressing education reform goals

Words Matter: Are We Talking Past Each Other?

Words, in and of themselves, are just words. You can look them up in the dictionary to find their meaning. Take, for instance, the word green: (adjective) of the color between blue and yellow in the spectrum; colored like grass or emeralds. A typical usage might be: The leaves are bright green.

The problem isn't the word. It is when the word has been used to mean something else. For example, the word green is used to describe practices that are environmentally friendly. With that meaning, the word might then be used in contexts that either align with or go against one's beliefs, ideologies, social or cultural values, political party affiliation, or other associations. Then words can become divisive.

Program participants and partners hearing what they consider to be partisan words might opt out, thinking "this isn't for me" or "this won't be a fair conversation." How might the language you use influence how you or your programs are perceived and received?

Two studies provide interesting results:

An investigation, conducted by researchers at UC Berkeley, Stanford University, and Johns Hopkins University,[1] provides important evidence that language coded as partisan is perceived differently at the neurological level, depending on the individual's political stances. The researchers "scanned the brains of more than three dozen politically left- and right-leaning adults as they viewed short videos involving hot-button immigration policies, such as the building of the U.S.-Mexico border wall, and the granting of protections for undocumented immigrants under the federal Deferred Action for Childhood Arrivals (DACA) program." Their findings suggest that "liberals and conservatives respond differently to the same videos, especially when the content being viewed contains vocabulary that frequently pops up in political campaign messaging."

Along the same lines, Philanthropy for Active Civic Engagement (PACE) has been actively studying civic language for five years.[2] The project "seeks to understand people's perceptions of the language associated with civic engagement and democracy work." In exploring the relationship between the words we use and how they are perceived by others, they ask this essential question: "Are we talking past each other about the values we think we share?"

[1] Anwar, Y. 2020. "Hot-Button Words Trigger Conservatives and Liberals Differently. UC Berkeley News."
Retrieved from https://news.berkeley.edu/2020/10/20/hot-button-words-trigger-conservatives-and-liberals-differently/
[3] PACE.2024. "Civic Language Perceptions Project 2024: How Civic Language Unites, Divides, & Motivates American Voters."
Retrieved from https://www.pacefunders.org/language/

DID YOU KNOW?

Words Matter: Are We Talking Past Each Other?

How to Talk Bridgey,[3] published by PACE in 2024, summarizes this research and dives into the power of language to bridge divides. The guide offers critical lessons on using civic language to foster connection across differences. Drawing from extensive research on how 5,000+ American voters perceive various civic terms, it provides practical strategies for communicating in ways that resonate broadly. The report emphasizes the importance of choosing words that foster connection rather than division. In their studies, PACE examined 21 words, including advocacy, belonging, civility, community, diversity, freedom, liberty, patriotism, racial equity, social justice, and service. The top five "bridgeyness" words or words that people generally agree they like and don't perceive as being polarizing were: community, service, belonging, liberty, and freedom. The least "bridgey" words according to the analysis were: social justice, racial equity, republic, diversity, and patriotism.

PACE does provide a word of caution when interpreting their results:

> Don't throw away the less bridgey words! Our bridgeyness strength analysis should not be understood as a "do say this and don't say that" list or recommendation. Instead, we offer it as one input to understand the potential mechanics of how to bridge across differences. All these words carry a lot of meaning and represent important values for a lot of people; none of them are inherently "good" or "bad." For those seeking to communicate across differences, we hope acknowledging the less bridgey words will be an invitation to better interrogate what signals they send, why, and how to leverage those signals for what you are trying to achieve.

If you'd like to learn more, these resources may be of interest:

• Braver Angels. n.d. "3 Quick Tips for Braver Conversations." Request from https://braverangels.org/
• CLEAN. 2025. "Controversy in the Classroom." Retrieved from
  https://cleanet.org/clean/literacy/tools/controversy.html
• Wildlife Management Institute. 2021. *Words Matter: Determining How to Engage the American Public Through the Language of Conservation*.
  Retrieved from https://wildlifemanagement.institute/sites/default/files/WMI-Words-Matter-Report-2021.pdf

[3] PACE.2024. "How to Talk Bridgey: Civic Language Perceptions Project." Retrieved from
  https://www.pacefunders.org/language/

3.2 Environmental information, misinformation, and disinformation

Educators recognize that reliable sources strengthen learning. They analyze information, misconceptions, and misinformation, and they investigate controversies.

- Evaluate the accuracy, perspective, credibility, and relevance of information from a variety of sources, including scientific sources.
- Reflect on personally held perspectives and how they shape education practices.
- Analyze and select materials that together present a range of world views, experiences, viewpoints, and ethical positions.
- Explore common misconceptions about the environment and consider why people might hold these ideas.
- Investigate how environmental misinformation and disinformation have been used to influence emotional responses, perceptions, policy, and action.
- Analyze ways of building information literacy.

The Difference Between Misinformation and Disinformation

Misinformation is false or inaccurate information—getting the facts wrong. Disinformation is false information which is deliberately intended to mislead—intentionally misstating the facts.

American Psychological Association. 2024. "Misinformation and Disinformation." Retrieved from https://www.apa.org/topics/journalism-facts/misinformation-disinformation
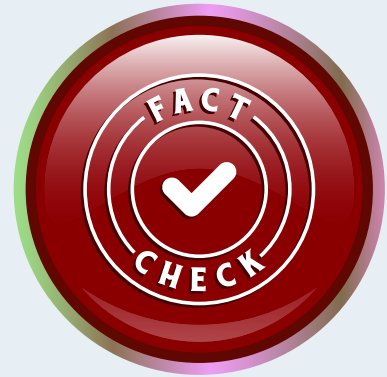
3.3 Facilitation of critical thinking and action skills

Educators recognize their responsibility to support the development of environmental literacy and to prepare and empower learners to use critical thinking skills to investigate environmental concerns, form and evaluate personal views, evaluate the need for action, understand a broad range of environmental action strategies, and plan and take action of their choosing.

- Explore instructional strategies and techniques that encourage learners to explore different perspectives, engage in thoughtful discussion, and reflect on any confirmed or changed perceptions. For example, develop and practice deliberation skills to actively listen to other perspectives and recognize areas of common ground.
- Analyze the characteristics of a range of civic actions (e.g., volunteering, voting, ecological restoration, engaging with decision-makers, advocacy).
- Describe why fostering critical and creative thinking are important in light of environmental education's goal of developing environmentally literate community members.
- Understand the developmental and educational considerations that support young children, older children, youth, and adults as they explore environmental decision-making and action taking.
- Examine the role of developing constructive hope—the cognitive and emotional process of engaging with and shaping the future with a plan to achieve a goal—in action taking.
- Investigate instructional models focused on taking action, such as civic engagement, issue investigation, action civics, and environmental behavioral change. Consider the role of education in the development of action competence, personal agency, collective agency, and self-efficacy.

DID YOU KNOW?
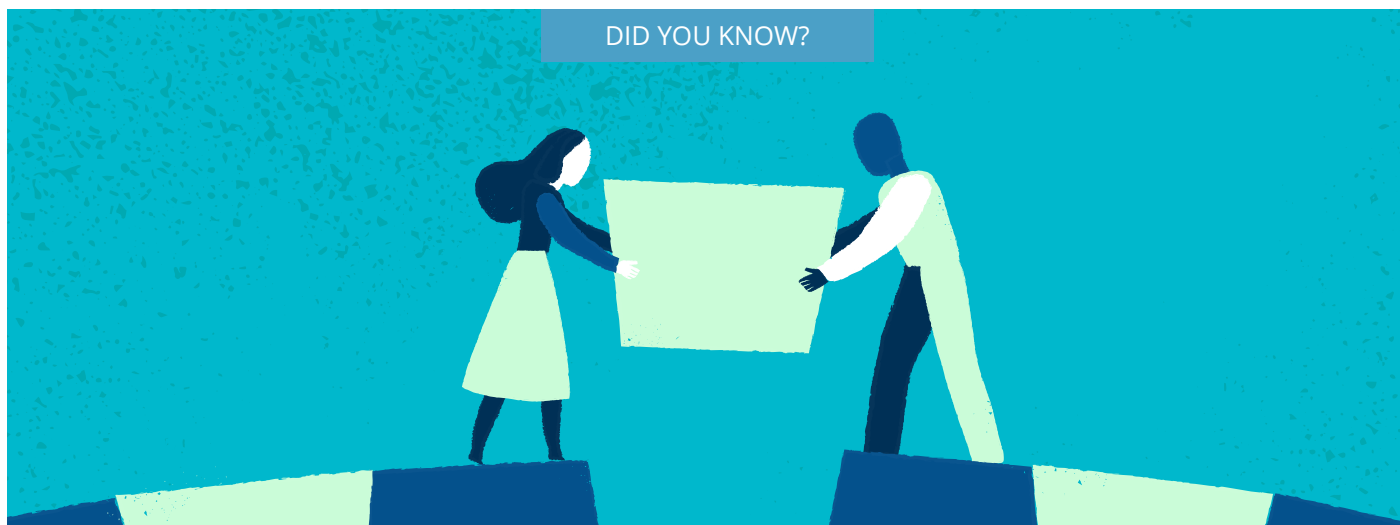
Creative Thinking, Critical Thinking, and Deliberation Skills

There are hundreds of different frameworks defining a range of thinking skills and practices. The following provides definitions for just a few that are particularly important to environmental education.

Creative Thinking

Think Creatively: Use a wide range of idea creation techniques (such as brainstorming). Create new and worthwhile ideas (both incremental and radical concepts). Elaborate, refine, analyze, and evaluate their own ideas in order to improve and maximize creative efforts.

Work Creatively with Others: Develop, implement, and communicate new ideas to others effectively. Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work. Demonstrate originality and inventiveness in work and understand the real-world limits to adopting new ideas. View failure as an opportunity to learn; understand that creativity and innovation is a long-term, cyclical process of small successes and frequent mistakes.

Source: Partnership for 21st Century Learning. 2019. Framework for 21st Century Learning Definition.
Retrieved from http://static.battelleforkids.org/documents/p21/P21_Framework_DefinitionsBFK.pdf

Critical Thinking

Critical thinking occurs when students are analyzing, evaluating, interpreting, or synthesizing information and applying creative thought to form an argument, solve a problem, or reach a conclusion. Critical thinking entails many kinds of intellectual skills, including developing well-reasoned, persuasive arguments and evaluating and responding to counter arguments; examining concepts or situations from multiple perspectives,…questioning evidence and assumptions to reach novel conclusions; devising imaginative ways to solve problems, especially unfamiliar or complex problems; formulating and articulating thoughtful, penetrating questions; and identifying themes or patterns and making abstract connections across subjects.

Source: Great Schools Partnership. 2013. "Glossary of Educational Reform."
Retrieved from https://www.edglossary.org/critical-thinking/

Deliberation

Deliberation—long and careful consideration or discussion. Deliberation is a process of thoughtfully weighing options. The discovery of a shared direction, guided by what we value most. … It's about looking at the costs and consequences of possible solutions to daunting problems, and finding out what we, as a people, will and will not accept as a solution. … We must listen to one another, test ideas, weigh options and balance tradeoffs to find where our various interests overlap—where purposes can be joined towards a shared future.

Source: National Issues Forums. 2023. "What is Deliberation?" Retrieved from https://www.nifi.org/en/deliberation

DID YOU KNOW?

Defining Efficacy and Agency

We hope our learners will achieve their goals, especially environment-related ones. But what factors contribute to their success? Cognitive theory suggests that efficacy and personal agency are critical.

Individual Self-Efficacy

Self-efficacy refers to an individual's belief in [their] capacity to execute behaviors necessary to produce specific performance attainments.... Self-efficacy reflects confidence in the ability to exert control over one's own motivation, behavior, and social environment. These cognitive self-evaluations influence all manner of human experience, including the goals for which people strive, the amount of energy expended toward goal achievement, and likelihood of attaining particular levels of behavioral performance.

Source: American Psychology Association (APA). 2009. "Teaching Tip Sheet: Self-Efficacy."
Retrieved from https://www.apa.org/pi/aids/resources/education/self-efficacy

Collective Efficacy

A group's shared belief in its conjoint capability to organize and execute the courses of action required to produce given levels of attainment.

Source: Bandura, A. 1977. "Self-Efficacy: Toward a Unifying Theory of Behavioral Change." *Psychological Review*, 84, 191-215 1977. Retrieved from https://psycnet.apa.org/record/1977-25733-001

Personal, Proxy, and Collective Agency

Agency refers to the human capability to influence one's functioning and the course of events by one's actions.

People exercise their influence through three forms of agency: individual, proxy, and collective. In agency exercised individually, people bring their influence to bear on what they can control. In proxy agency, they influence others who have the resources, knowledge, and means to act on their behalf to secure the outcomes they desire. In the exercise of collective agency, people pool their knowledge, skills, and resources and act in concert to shape their

Source: Bandura, A. 2023. "Agency.". Retrieved from https://albertbandura.com/albert-bandura-agency.html#:~:text=In%20the%20exercise%20of%20collective,a%20psychology%20of%20human%20agency.

3.4 Reflective and reflexive practices

Educators proactively reflect on and improve their practices, considering the impact of their actions on learners, themselves, and others. They commit to engaging in reflexive practices, challenging their assumptions and perspectives about learners, other educators, and environmental education.

- Reflect on and learn from personal practices as an educator, both individually and with other professionals and colleagues. Use tools such as peer coaching, portfolios, and journaling to support reflection.
- Use reflection to search for understanding—considering one's own perceptions of an event or experience and how others perceived that event or experience.
- Take informed actions, adjusting and responding to identified issues, to create empowering learning environments for all.
- Understand and challenge one's own beliefs, values, and assumptions about learning, learners, and teaching.
- Work with a coach, mentor, or facilitator to process professional reflections and consider appropriate responses.
- Use reflexivity to foster self-awareness, to unlearn outmoded practices, and to re-learn and refresh relevant skills.
- Identify workplace practices that encourage thoughtful discussion, reflection, and critical thinking in teaching.

GUIDELINES IN PRACTICE

NAAEE's Accreditation of Higher Education Programs: A View from University of Minnesota Duluth

Program Overview

The Master of Environmental Education Program (MEEd) at the University of Minnesota Duluth traces back to 1991. While the program has evolved over the years, it has remained an integral part of UMD's place-based identity as a campus on the shores of Lake Superior and a community that deeply values sustainability, environmental education, nature engagement, and outdoor recreation. Leveraging our region's rich history and culture of valuing natural resources, MEEd engages with the expertise of our regional environmental education community, including partners such as Sea Grant, Boulder Lake Environmental Learning Center, Hawk Ridge, Hartley Nature Center, Great Lakes Aquarium, Lake Superior Zoo, Lake Superior National Estuarine Research Reserve, Independent School District 709, Duluth Nature Play Collaborative, state parks, Voyageurs Conservancy, Superior National Forest, and the Boundary Waters Canoe Area Wilderness. We embrace an experiential approach to engaging students in the environmental opportunities and challenges of our communities and contributing to a sustainable future through environmental education. We aim for excellence in environmental education practice, leadership, and scholarship..

The MEEd program is a fully in-person program with two plans. Both plans are 32 credits and can be completed in two years. Students in both plans take coursework in core foundations, a research methods course, and coursework on applications and/or teaching strategies. Plan B students take additional research coursework and complete a research project. Plan C entails only coursework, with an option to develop EE curriculum as an independent study. We also have a stackable certificate option.

GUIDELINES IN PRACTICE

NAAEE's Accreditation of Higher Education Programs: A View from University of Minnesota Duluth

Our Decision to Seek NAAEE Accreditation

The MEEd program has been accredited by NAAEE since 2017. Our decision to seek accreditation was part of our work at that time to revisit, revise, and clarify our learning outcomes and degree requirements. We were using a previous edition of the Environmental Educator Knowledge and Skills: Guidelines for Excellence to guide our curriculum revisions; working through the accreditation self-study process to reflect on our revisions and evaluate whether we were on track seemed the right next step. We used both the guidelines and the self-study process as guideposts, giving us the confidence that our changes were driven by something more substantive than what we thought the program should entail, especially knowing the guidelines were carefully crafted and widely vetted by practitioners and scholars in EE.

Benefits of Accreditation

One main benefit of NAAEE's accreditation is our ability to communicate internally and externally that our program is rigorous and of high quality; we think of it as a seal of approval. While initially our university didn't ask us to become accredited, accreditation has become more important over the years, particularly in the face of budget cuts. Practically speaking, on our campus, programs can use a professional accreditation process in place of an external review. This has been another benefit since an external review communicates quality to the campus administrators but less so to an external audience. Additionally, the NAAEE accreditation self-study document and the associated documentation of learning outcomes align well with our campus assessment procedures, and we have found it quite feasible to collect learning outcome data that serves both the NAAEE accreditation process and our campus assessment requirements.

An additional benefit is being able to converse with students about how course learning outcomes align with program outcomes, and how our program learning outcomes are grounded in the Guidelines, which models program development and curriculum design concepts. Additionally, students come to our program from a breadth of fields beyond EE, and not all are familiar with NAAEE. Through these conversations, we have the opportunity to introduce students to NAAEE and one of its many facets. We also include our accreditation in our marketing and recruitment materials to communicate to prospective students that our program is of high quality.

GUIDELINES IN PRACTICE

NAAEE's Accreditation of Higher Education Programs: A View from University of Minnesota Duluth

Our Experience with the Accreditation Process

Assessment, evaluation, self-studies, and external reviews can be time-consuming and at times daunting. Compared to a recent external review for an undergraduate program, the NAAEE accreditation self-study process seemed more program-focused and better aligned with our ongoing assessment of learning outcomes than our university's external review criteria and process. We found the NAAEE accreditation self-study to be both feasible and meaningful. For example, while working on the self-study, it became apparent that some learning outcomes were mapped to elective courses, which prompted a revision of which courses were considered electives versus required. And while the process of accreditation is high stakes, we appreciated that questions could be asked and guidance offered by the accreditation leadership team. We also appreciated that we had the opportunity to respond to questions from the reviewers of our self-study before they finalized their recommendations and decision.

Final Thoughts

When we first became accredited by NAAEE, we were among just a few other programs that had earned this accreditation. As the list of NAAEE-accredited higher education programs grew, it was initially tempting to think that our competition was growing and that we no longer stood out in the way we once did. Over time, we have recognized that having many NAAEE-accredited higher education programs is a really good thing, as it means the strength, quality, and influence of our field are growing! Accreditation encourages excellence and in-depth, continual assessment and improvement. We now see maintaining our accreditation as not only good for our program, but good for the field of environmental education as a whole. As such, we plan to maintain our accreditation as a way of contributing to the quality of our profession.

To learn more about the Master of Environmental Education Program (MEEd) at the University of Minnesota Duluth, visit: https://academics.d.umn.edu/environmental-education-meed

To learn more about NAAEE's Higher Education Accreditation program, visit: https://naaee.org/programs/higher-education-accreditation

Written by Julie Ernst, Professor, University of Minnesota Duluth

3.5 Ongoing learning and professional development

Educators acknowledge the need to be active learners in their professional lives and consistently seek out and incorporate professional learning opportunities.

- Identify and practice ways of staying updated on environmental issues, current research, environmental education materials, and instructional methods. For example, read research and evaluation articles relevant to your work, join and actively participate in local, state/provincial, national, tribal, or international organizations associated with environmental education; or participate in a professional certification program.

- Develop relationships with mentors, advisors, and others who challenge educators to upgrade their knowledge and skills and expand their firsthand understanding of different points of view about environmental issues and environmental education practice.

- Engage in professional development opportunities such as workshops, courses, and conferences offered by national, tribal, state/provincial, and local environmental education programs and professional organizations.

- Pursue 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.

- Apply research and analytical skills to expand existing knowledge about the environment, related issues, and environmental education.

- Take part in opportunities to advocate for environmental education. For example, serve on the board of the state/provincial professional association or promote environmental education in the local school district.

• See Resource #5, page 103, to access a series of self-paced, online learning modules focused on the foundations of environmental education.

GUIDELINES IN PRACTICE

Setting a Statewide Standard for Environmental Education

Professional certification ensures that individuals are fully prepared for work within a specific field of expertise. Certified environmental educators meet stringent requirements for proficiency in both the interdisciplinary content and pedagogy necessary to develop and deliver high-quality, effective EE programs. As such, environmental education certification programs address the knowledge, skills, and ethical standards important to effective practice.

Certification provides robust professional development opportunities, and its focus on both theory and practice leads towards greater proficiency. Environmental Education Certification Programs recognized by NAAEE are founded on NAAEE's Environmental Educators Knowledge and Skills: Guidelines for Excellence.

Many certification programs adhere to a Code of Ethics that acts as a touchstone during their certification work and beyond. For example, the Virginia Environmental Education Certification Program Code of Ethics, adopted in January 2022, states that "by working as a Virginia environmental educator, you are accepting a position of public trust." They go on to state that certified environmental educators must "meet this obligation and uphold the dignity of the profession."

While attaining certification is not necessary to be employed as an environmental educator, taking part in a certification program is an important step in elevating the profession and each professional's work.

In pursuing her Environmental Education Certification in Virginia, Kathleen Herron "realized this opportunity would allow me to collaborate with experts, and I would have to get out of my comfort zone. Once I understood the scope of the program, I was committed to the program and challenged myself to finish."

Among the Virginia Environmental Education Certification Program's requirements is a community partnership capstone project where candidates for certification employ their enhanced skills and knowledge. Since candidates serve in a variety of capacities—schools, arboretums, as volunteer Master Naturalists, business owners, and a host of other venues—each project is unique and serves a different type of community.

GUIDELINES IN PRACTICE

Setting a Statewide Standard for Environmental Education

At Riverside Elementary School in northern Virginia, teachers and students dove into a well-orchestrated Earth Week that actively engaged learners and educators via developmentally appropriate and place-based projects. With a requirement to complete the work via partnerships, every grade level had outside partners support their work, including work with Fairfax Stormwater as they implemented their Revitalize, Restore, Replant program and installed a pollinator garden in conjunction with lessons that support state Standards of Learning.

Environmental educators working in outreach settings are also benefiting from certification programs that put the Guidelines into action. At the Edith J. Carrier Arboretum at James Madison University, 7th graders are engaging in problem-based learning via a place-based watershed education program—another Capstone project. Katie Rankin, Certification candidate and education coordinator at the arboretum, reflected, "My certification work provided a robust scaffold on which to innovate this program to meet our school district's needs. My foundations in science concepts, community collaboration, sense of place, and systems thinking have all been enhanced by the certification process and are the things I'm proudest of in this part of my work."

Throughout the Certification process, candidates stretch themselves to apply current research and best practices in order to bolster their learners' critical thinking and problem-solving skill that they are enabled to participate in their communities' environmental well-being.

For more information about environmental educator certification, please visit:
- Virginia Association for Environmental Education (VAEE) certification program, https://www.eevirginia.org/programs/certification.
- North American Association for Environmental Education (NAAEE). Certification, https://naaee.org/programs/certification.

Written by Tara Poelzing, Director of Professional Learning, Virginia Association for Environmental Education
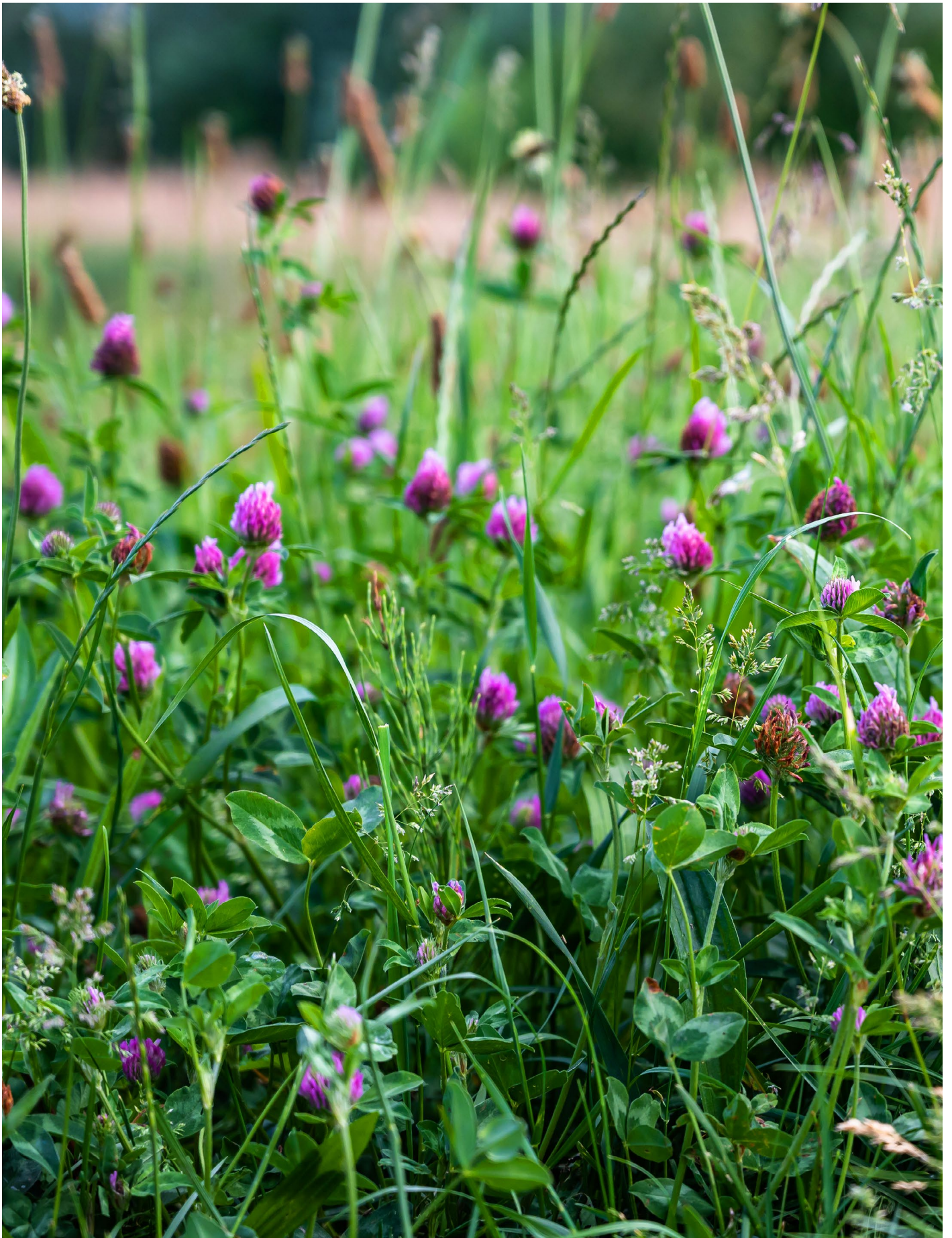
Key Characteristic #4:

Commitment to Community, Collaboration, and Fairness

Key Characteristic #4

Commitment to Community, Collaboration, and Fairness

Educators understand and accept that instruction with a focus on community, collaboration, and fairness is crucial to environmental education.

4.1 Community-centered

Educators commit to anchoring environmental aims within the context of community interests, issues, and capacities and put the community at the heart of environmental education.

- Get to know and understand the community, its interests, priorities, aspirations, and norms through ongoing interactions with various groups that compose the community.
- Link environmental education goals with the interests, aims, and resources of the community.
- Test personal presumptions and perceptions about the composition of the community with other community members and potential partners.
- Focus on community assets and shared priorities.
- Support professional development, including college/university courses, that promotes community-engaged environmental education.
- Promote agency, action, and collective hope by facilitating relationships and collaboration with communities and community-based organizations.

4.2 Collaboration and belonging

Educators commit to working in collaborative relationships, partnerships, and coalitions. They accept the responsibility of creating learning environments that foster a sense of belonging.

- Seek out and include a variety of resources and perspectives in instruction.
- Identify and practice ways of promoting a culture of openness, curiosity, and respect where everyone feels welcome.
- Review non-personal educational resources and classroom displays (e.g., signage, exhibits, audio tours, digital media) with a critical lens to create a welcoming environment.
- Seek opportunities to work with individuals, groups, and organizations with different experiences, abilities, and operating styles to plan and implement collaboratively.
- Critically evaluate one's own ways of knowing and perspectives, including how they inform an understanding of environmental education and approach to learners.
- Deliberate, listen, welcome, involve, and integrate voices directly. Encourage open communication.

GUIDELINES IN PRACTICE

Water Reflections Across Generations

Growing up, my father would take my sister and me canoeing on the river behind our house. I've always lived next to a water body, even when I moved to Lüneburg and then Wageningen for my studies or to Berlin for work. **For me, water is a place where I can catch my breath and where I can find myself again in times of change, which is a privilege of course**.

Water is key to solving some of the biggest challenges humanity is facing. Whether floods, droughts, hunger, health, or pollution, at the end of the day, water was, is, and will be critical for human survival. The way we treat our water right now, how (much) we use it, determines the life of future generations. Through water, we are connected not only to our neighbors downstream but also to different cultures, climate zones, and generations. The Potawatomi, Algonquian Native American people, whose native land is located in the Great Plains and in the western Great Lakes regions of the United States, use the same water as the Chenchus, a native tribe of India with significant populations in Andhra Pradesh and Telangana.

Dating back to our ancestors, we all have a story with water. By sharing these stories, we can learn a lot from and with each other, working together towards a more sustainable use of the precious resource.

Now pause for a second, breathe, and read the previous sentence again, because that is exactly what we aim for with the H2Our project.[1] As an NAAEE CEE-Change Fellow,[2] I teamed up with Gaurav Shorey, representing 5waraj,[3] to re-activate traditional knowledge and gather traditional wisdom on the use and appreciation of water. We are collecting stories from community elders and sharing them with younger generations, encouraging them to do the same with their elders, and creating public awareness towards a more sustainable use of water.

[1] To learn more about the H2Our project, visit: https://www.instagram.com/theh2our_project/
[2] To learn more about NAAEE's CEE-Change Fellowship, visit: https://naaee.org/programs/cee-change-fellowship
[3] To learn more about 5waraj, visit: https://5waraj.in/

GUIDELINES IN PRACTICE

Water Reflections Across Generations

Key elements of the H2Our project are interviews to gather individuals stories about water. These stories offer a unique and intimate path to informal learning.

Our first interview for the project was very special, as the interviewee was 86-year-old Marianne Borgers, my beloved grandma. When I asked her if she would have a conversation about water with me, she immediately agreed and started telling me stories about their bathing rituals in former times. She told me about how their dog had to bathe last and would then sit in front of the oven until his fur was dry again. At that point, I knew: I was about to discover a treasure of knowledge. So I gathered some equipment, set up a camera and a small microphone, and then we lost ourselves in a long, profound, and very teachable conversation.

Growing up with strong Catholic values in a small rural village in the state of North-Rhine Westphalia, Germany, my grandmother Marianne and her family were privileged to have their own water access point right in front of their house. The quality of the water they got from there still exceeds quality standards today. Within our interview, I heard stories about washing clothes, bathing, and cooking, and how, over time, she recognized changes in water consumption. She reflected, *"Honestly, we are probably consuming more water in the household than before. Because the young ones, they just don't turn the crane off when they brush their teeth and let it all run. It runs all, for nothing and again nothing."*

Confronting several classes of German high school students with that truth, we realized how people treat(ed) water differs across climate zones, cultures, and generations. In addition, I took some major learnings with me:

1. It is incredibly important to save and reactivate the knowledge of our elders, as valuable treasures of knowledge lie within their memories.
2. Informal conversations are an effective way to learn, as the information is connected to the personal experiences and feelings of real people.
3. Sharing the learnings from our interviews has a great impact, as it is time to re-anchor the value of water in our minds and adapt our use and appreciation of water to current and future challenges.

These insights led me to question how teaching and learning are practiced in schools and universities. Why don't we have conversations with community elders? Sure, it's important to know about the growth kinetics of microorganisms when designing a biological wastewater treatment system, but what applicable lessons can we learn from also talking to our elders? Because they used water more sparingly, the amount of wastewater that needed to be treated was lower in the first place.

Since the earliest human communities, water has been a place of community and inspiration. Water is ultimately my inspiration for the work I am doing within the H2Our project.

Written by Carolin Ellerkamp PhD candidate at the Wageningen Institute for Environment and Climate Research (WIMEK), which is part of Wageningen University & Research in the Netherlands.
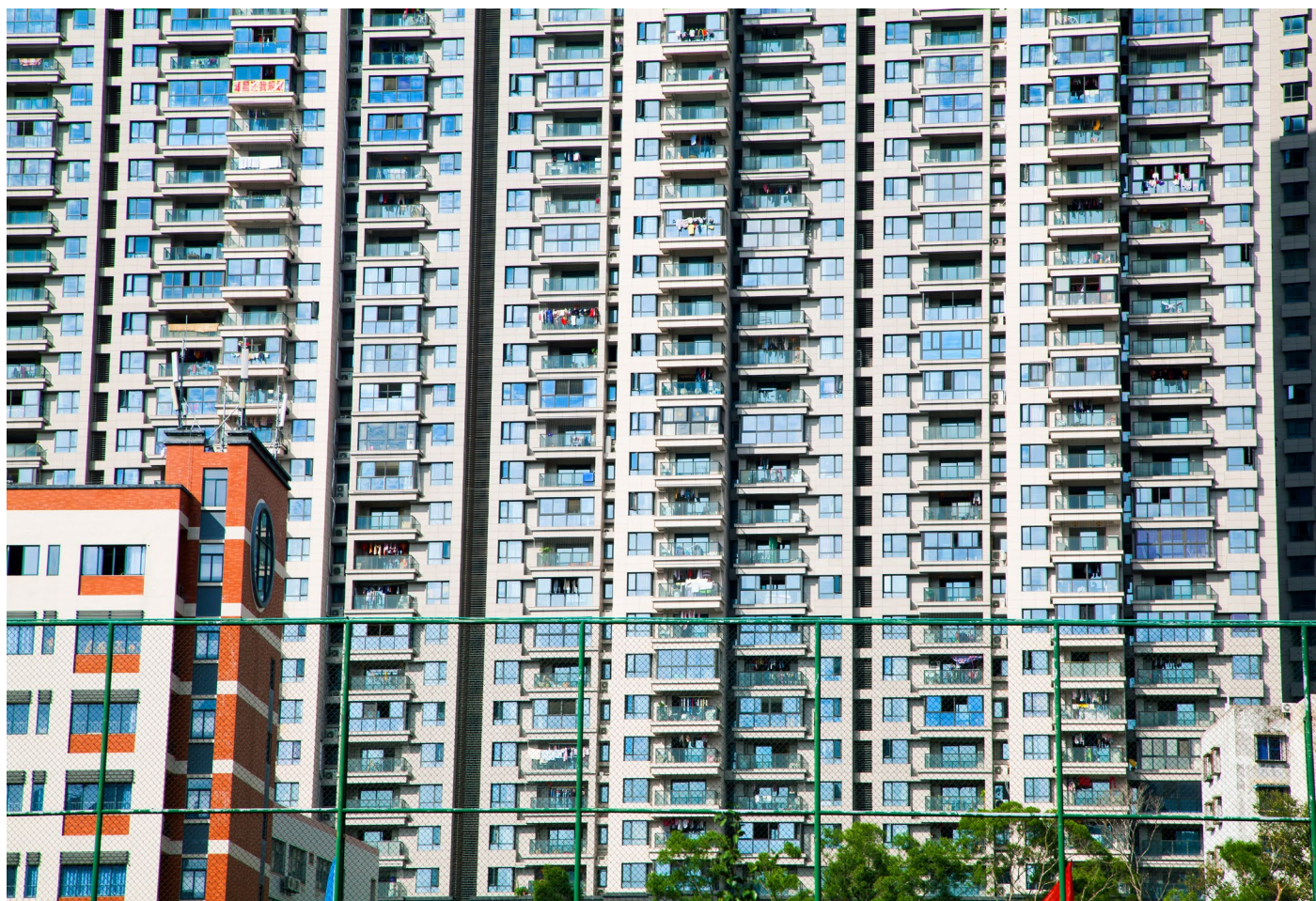
4.3 Fairness

Educators commit to actively co-create systems and practices that are fair and honor each learner's dignity and worth. They understand how environmental concerns affect community members, explore the potential effects of proposed solutions on community members and the environment, and engage community members in developing environmental solutions.

- Explore the distribution of environmental impacts across communities, regions, and the world. Work towards solutions to environmental concerns by committing to the effective participation of the communities most directly impacted.
- Explore the root causes of environmental concerns, including social, political, economic, and geographic implications.
- Create opportunities for all learners to participate in environmental education.
- Consider how environmental education can augment community well-being, sustainability, and resilience.
- Strive to ensure clean air, clean water, and safe outdoor spaces for all.
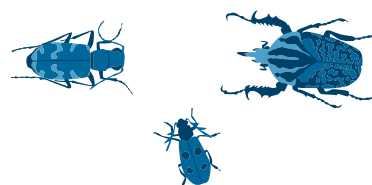
Design & Implementation

Educators build on their understanding of the history, philosophy, ongoing development, professional responsibilities, and commitments of environmental education to plan and implement high-quality programs.

Key Characteristic #5:

Planning Environmental Education

Key Characteristic #5

Planning Environmental Education

Educators combine the fundamentals of high-quality education with the unique features of environmental education to design effective instruction. Educators plan interdisciplinary, experiential, investigative learning opportunities that are central to environmental education.

5.1 Instructional planning

Educators design developmentally appropriate instructional content and strategies with well-articulated goals and objectives that lead to environmental literacy, meet the needs of learners, and address community concerns and aspirations. Educators build programs on a foundation of quality instructional materials. As appropriate, educators purposefully co-design instruction in collaboration with partners and other community members.

- Produce a plan for environmental education instruction and demonstrate how the plan and specific elements enhance coordination or integration across disciplines or help meet specific goals of environmental education.
- Articulate specific, measurable goals and objectives that foster the development of environmental literacy. For example, write goals and objectives that address applicable UN Sustainable Development Goals or are consistent with the content outlined in this document, Early Childhood Education: Guidelines for Excellence, K–12 Environmental Education: Guidelines for Excellence, or comparable expectations for adults.
- Describe how environmental education plans will help learners meet relevant national, tribal, state/provincial, and local educational standards for learning performance in specific disciplines. Show how the plan aligns with the school/organization/agency's goals, supports academic objectives, and addresses community concerns and aspirations.
- Ensure that planned content reflects current, accepted, and well-documented information from the sciences, social sciences, and other knowledge systems such as local knowledge and Indigenous Knowledges.
- Confirm that plans present multiple perspectives on environmental concerns as appropriate for the intended age level.
- Employ a variety of instructional strategies ranging from lecture and discussion to action research, and from reading assignments to panel discussions and deliberation.

DID YOU KNOW?

Differentiated Instruction

Instruction should meet the learning needs of all students, whether they are 3 years old, 13 years old, or 83 years old. Differentiated instruction can help you determine whether the instruction you are delivering meets the needs of all learners.

Differentiated Instruction

Differentiated instruction is an approach whereby teachers adjust their curriculum and instruction to maximize the learning of all students: average learners, English language learners, struggling students, students with learning disabilities, and gifted and talented students. Differentiated instruction is not a single strategy but rather a framework that teachers can use to implement a variety of strategies, many of which are evidence-based. These evidence-based strategies include:

- *Employing effective classroom management procedures*
- *Grouping students for instruction (especially students with significant learning problems)*
- *Assessing readiness*
- *Teaching to the student's zone of proximal development*

Source: IRIS Center, Peabody College Vanderbilt University. 2020. "Differentiated Instruction: Maximizing the Learning of All Students." Retrieved from https://iris.peabody.vanderbilt.edu/module/di/cresource/q1/p01/

Zone of Proximal Development

The Zone of Proximal Development is an important construct related to differentiated instruction, especially for young children and English Language Learners/Multilingual Learners.

The Zone of Proximal Development was a key construct in Lev Vygotsky's theory of learning and development. The Zone of Proximal Development is defined as the space between what a learner can do without assistance and what a learner can do with adult guidance or in collaboration with more capable peers.

In the case of English language learners (ELLs)/Multilingual learners (MLLs), the immense potential that they bring to our classrooms is comprised of their intellectual, linguistic, and creative strengths that are waiting to be built upon. Educators must provide students appropriate learning experiences and support to help them realize their potential development. The goal of instruction is to foster our ELLs'/MLLs' autonomy and their ability to engage in activities that enable them to apply and modify what they have learned to new situations.

Source: Billings, E. and Walqui, A. 2017. "Zone of Proximal Development: An Affirmative Perspective in Teaching ELLs." Retrieved from https://www.wested.org/resource/zone-of-proximal-development/

5.2 Knowledge of learners

Educators use their knowledge of learners to plan instruction. They analyze learners' interests, ways of knowing, abilities, and developmental levels. They determine current levels of learner awareness, knowledge, skills, motivations, and attitudes toward the environment. They tailor instructional plans to meet the needs of, yet challenge, different learners.

- Plan instruction to ensure that all learners feel welcome and can participate fully in learning opportunities. Identify and implement methods for presenting the environment or environmental issues in appropriate, clear, and engaging ways for learners of different ages, levels of knowledge, and experiences.
- Adjust instructional plans to account for differing learner attributes, including their ways of knowing, talents, perspectives, interests, literacy levels, awareness levels, knowledge, skills, motivation, attitudes, and experiences with environmental issues. Consider using resources and frameworks such as Universal Design for Learning (UDL) and differentiated instruction in your planning.
- Use an understanding of learning theories to organize environmental education instruction to accommodate learner needs.
- Apply theories of cognitive, social, and behavioral development in creating an environmental education instructional plan for a particular age level, class, or group.
- Determine whether facilities, technologies, and proposed program activities comply with both the spirit and letter of the Americans with Disabilities Act (ADA), the Individuals with Disabilities Education Act (IDEA) and Section 504 of the Rehabilitation Act.
- Acknowledge the validity of varying perspectives present in groups of learners. Tailor instructional plans to respond to these perspectives.

DID YOU KNOW?

Universal Design for Learning

Ultimately, the goal of Universal Design for Learning (UDL) is to support learner agency, the capacity to actively participate in making choices in service of learning goals. The UDL Guidelines inform the design of learning environments to support learner agency that is:

- ***Purposeful**—internalized self-efficacy, acting in ways that are personally and socially meaningful*
- ***Reflective**—self-awareness and metacognition to identify internal motivations and external influences that support learning and make adjustments when necessary*
- ***Resourceful**—understanding and applying assets, strengths, resources, and linguistic and cultural capital*
- ***Authentic**—increasing comprehension and deepening understanding in ways that are genuine*
- ***Strategic**—setting goals and monitoring learning with intentionality and planfulness*
- ***Action-oriented**—self-directed and collective action in pursuit of learning goals*

Agency involves learners' ability to regulate their affective, cognitive, and behavioral processes as they interact within the learning environment....

Designing learning environments that support learner agency requires continually examining power dynamics by challenging structures that view the educator as the sole authority and creating space for learners to make sense of content individually and collectively through interaction and reflection.

UDL aims to change the design of the environment rather than to situate the problem as a perceived deficit within the learner. *When environments are intentionally designed to reduce barriers, every learner can engage in rigorous, meaningful learning.*

Source: CAST. 2024. "Universal Design for Learning Guidelines (version 3.0)."
Retrieved from https://udlguidelines.cast.org/more/udl-goal/

Key Questions to Consider When Planning Lessons

Think about how learners will engage with the lesson.
- Does the lesson provide options that can help all learners:
  — Regulate their own learning?
  — Sustain efforts and motivation?
  — Engage and interest all learners?

Think about how information is presented to learners.
- Does the information provide options that help all learners:
  — Reach higher levels of comprehension and understanding?
  — Understand the symbols and expressions?
  — Perceive what needs to be learned?

Think about how learners are expected to act strategically and express themselves.
- Does the activity provide options that help all learners:
  — Act strategically?
  — Express themselves fluently?
  — Physically respond?

Source: Gordon, D., A. Meyer, and D. Rose. 2016. *Universal Design for Learning: Theory and Practice.* Wakefield, MA: CAST Professional Publishing. Access at http://udltheorypractice.cast.org

5.3 Environmental education materials and resources

Educators are knowledgeable about, access, and evaluate a range of materials and resources for their environmental education efforts. In their plans, educators employ high-quality instructional materials and techniques designed to meet environmental literacy learning goals and objectives and provide opportunities for experiential learning, social and emotional learning, and time for reflection.

- Detail ways in which the community can be a resource for environmental education, identifying local businesses, service organizations, government agencies, nonprofit organizations, and others that may participate in and support instructional programs.
- Identify and evaluate materials and education resources, including those accessed via the Internet, using criteria such as those suggested in *Environmental Education Materials: Guidelines for Excellence.*
- Recognize that environmental education may include (but is not limited to) elements of the natural world found around buildings or landscaping, including plants, animals, water, minerals/rocks, and myriad other organisms. Commit to engaging with these elements and organisms respectfully and ethically, as well as modeling this behavior for others.
- Select instructional materials that clearly address program goals and objectives, including the topics covered, skills and concepts developed, and key questions considered.
- Choose instructional materials that encourage learners to use their knowledge, skills, and assessments of environmental, social, political, cultural, and economic systems as a basis for environmental decision-making and action.
- Ensure that selected instructional materials and activities are developmentally appropriate (e.g., young children, youth, adults) and meet the needs of individual learners. Adapt materials to respond to individual differences among learners.

DID YOU KNOW?

Social and Emotional Learning Skills

Social and Emotional Learning

The Collaborative for Academic, Social and Emotional Learning (CASEL) defines social and emotional learning as the process through which children and adults acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions. It's generally accepted that five skill domains can serve as a framework for developing positive, healthy habits and skills in children and adults across all learning environments.

The definition and skill domains in this tool were developed by CASEL. For more information about CASEL's work in social and emotional learning in preschool through grade 12, visit https://casel.org.

Self-Awareness

The ability to accurately recognize one own emotions, thoughts, and values and how they influence behavior. The ability to accurately assess one's strength and limitations, with a well-grounded sense of confidence, optimism and a "growth mind-set."

Self-Management

The ability to successfully regulate one's emotions, thoughts, and behavior in different situations—effectively managing stress controlling impulses and motivating oneself. The ability to set and work toward personal and academic goals, including the ability to organize time and tasks.

Relationship Skills

The ability to establish and maintain healthy and rewarding relationships with diverse individuals and groups. The ability to communicate clearly, listen well, cooperate with other, resist inappropriate social pressure, negotiate conflict constructively, and seek and offer help when needed.

Social Awareness

The ability to take the perspective of and empathize with others, including those from diverse backgrounds and cultures. The ability to understand social and ethical norms for behavior and to recognize fanily, school, and community resources and supports.

Responsible Decision Making

The ability to make constructive choices about personal behavior and social interactions based on ethical standards, safety concerns and social norms. The ability to identify, analyze, and solve problems. The realistic evaluation of consequences of various actions, and consideration of the well-being of oneself and others.

Source: Adapted, with permission, from You for Youth. n.d. "Social Emotional Learning. Five Skill Domains of Social nd Emotional Learning (SEL)."
Retrieved from https://y4yarchives.org/index.php/en/tools/five-skill-domains-of-social-and-emotional-learning

5.4 Settings for instruction

Educators understand the importance of ensuring a safe and conducive learning environment, both indoors and outside. They plan experiences designed to connect learners to nature using a variety of settings (e.g., classrooms, nature centers, forests, urban areas).

- Plan instruction with a demonstrated concern for learner safety, especially when experiences will take place outside. Pay close attention to the physical layout and maintenance of the setting so learners can use it safely and effectively.
- Identify a variety of settings for instruction that are appropriate for learners, subject matter, and available resources. These may include the schoolyard, laboratory, field settings, community settings, museums, zoos, demonstration sites, and other places. Seek community expertise to identify a range of settings.
- Develop ways to expand the use of various settings (including outdoor settings) in educational and welcoming ways.
- Recognize that there are many traditions, ways of knowing, histories, experiences, and ways of relating to nature and the environment that are valid and valued. Keep these in mind as you plan learning activities in different settings.
- Design instruction that first links content to learners' immediate surroundings and experiences, then expands learners' horizons, as appropriate, to larger environmental issues and contexts. Root learning experiences in systems thinking that helps learners recognize their relationship with the environment and the topic at hand.

5.5 Curriculum and program planning

Educators develop plans for including environmental education in the curriculum and other educational programs.

- Identify 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 agency or other institution using criteria such as those outlined in *Environmental Education Programs: Guidelines for Excellence.*
- Develop a plan for integrating environmental education into the formal school curriculum (PreK–16), either across the curriculum or as a separate course or emphasis within one or more areas of study.
- Cross-reference environmental education learner outcomes with state/provincial education standards in relevant disciplines or age level.
- Develop programs geared towards different audiences, including adult learners.

> • See **Resource #13,** page 120, to learn about *Environmental Education Programs: Guidelines for Excellence* and how you can use them to help you design and implement effective environmental education programs.

5.6 Tools and technologies that assist learning

Educators access, vet, and use a range of technologies to assist learning.

- Identify how a variety of tools for environmental observation, measurement, and monitoring (e.g., magnifying glasses, chemical tests, survey and interview techniques, virtual reality headsets, and traffic counts) can be used in instruction.
- Develop plans for instructing learners in the safe and proper use of instructional technologies.
- Demonstrate proficiency with technologies (e.g., PowerPoint and other computer programs) used to display, analyze, and communicate environmental information.
- Identify sources of expertise about unfamiliar instructional technologies/tools and learn how to incorporate them into instruction.
- Recognize that technologies may be designed to mislead. Critically review materials, including social media and those generated by artificial intelligence (AI), that might be used in instruction.
- Plan for the use of assistive technology and adaptive equipment needed by people with impairments, such as vision, mobility, and hearing. Examples include all terrain wheelchairs, all terrain rolling walkers, trekking poles, scooters, Braille displays, large-print signage and brochures, screen reading software, text-to-speech systems, closed captioning, hearing loops, and magnifiers.

RESOURCES YOU CAN USE

Project Learning Tree, Project Wild, and Project Wet

Project Learning Tree

Project Learning Tree® (PLT) is committed to advancing environmental education, forest literacy, and green career pathways, using trees and forests as windows on the world. Through our work, which is amplified by a vast network of partners, PLT offers award-winning nature-based instructional materials, professional development opportunities for educators, and career pathways programs for young adults. Together, we are growing a new generation of leaders with the knowledge, skills, and motivation to address current and future environmental issues, such as climate resiliency and biodiversity conservation. PLT is an initiative of the Sustainable Forestry Initiative®, a non-profit charitable organization with the mission of advancing sustainability through forest-focused collaboration. Learn more at https://www.plt.org

Project WET

Project WET empowers educators to engage youth in understanding water and solving local and global challenges. We develop high-quality lessons to teach about all water topics—from water properties to water in Earth systems to water management. Our lessons are fun, engaging, and standards-based activities designed specifically for formal, non-formal, early childhood, and preservice educators to use with their students. These lessons are paired with professional development offered by our network of water education experts throughout North America, as well as in many other countries. We work to create water-literate communities that are inspired to value and protect water. Learn more at projectwet.org.

Project WILD

Project WILD's mission is to provide wildlife-based conservation and environmental education that fosters responsible actions toward wildlife and natural resources. All curriculum materials are backed by sound educational practices and theory and represent the work of many professionals within the fields of education and natural resource management from across the country. Professional development opportunities for formal and non-formal educators of pre-school through college are available in-person and online. Topics include wildlife ecology and management, aquatic wildlife, birds, human dimensions of wildlife conservation, and human health and wildlife. Visit us at: http://www.projectwild.org

Photo credit: © Friends of Sausal Creek   Photo credit: © Noah Slager

From Classroom to Creek

Earth Team's mission is to empower urban youth to become lifelong environmental stewards through experiential education, skills development, and the building of community connections. Based in Richmond, California, Earth Team is committed to delivering high-quality service-learning projects to regional high schools by partnering with education and environmental organizations and local government agencies.

For Earth Team interns, addressing the environmental challenges of the 21st century starts right at home. Each fall, on our ten partner campuses, we assemble teams of 12–24 students for a year-long internship focused on critical issues like watershed health, air and water quality, and biodiversity loss. The journey begins in the classroom, where students work closely with their internship coordinators to understand these environmental issues and develop curriculum priorities and community service projects tailored to their local areas. With these student-driven plans in hand, we partner with community organizations for weekend field events, including cleanups, data collection, community outreach, and more. Students gain valuable insights from these experiences, which they bring back to campus to share their findings and educate their peers.

As part of the eeBLUE 21st CCLC Watershed STEM Education Partnership Grant Program,[1] Earth Team interns from four campuses will dedicate the year to exploring and engaging with their local watersheds. In the classroom, they'll address issues like marine plastic pollution, overfishing, ocean acidification, algae blooms, and riparian corridor destruction. Along the way, they will gain hands-on STEM skills such as water quality testing, identifying macroinvertebrates and invasive species, and conducting litter assessments, along with insights from presentations by local experts.

With this knowledge, students will collaborate with community stakeholders to design projects that restore habitats, promote native plant survival, monitor litter trends, and raise public awareness about the importance of watershed preservation.

[1] NAAEE, in collaboration with NOAA and supported by the U.S. Department of Education, is working with twelve environmental education organizations to offer engaging after-school watershed-focused STEM (science, technology, engineering, and mathematics) programs. The eeBLUE 21st Century Community Learning Centers Watershed STEM Education Partnership Grants, support environmental education organizations collaborating directly with 21st CCLC sites. For more information, visit: https://naaee.org/programs/eeblue/watershed-stem-education-partnership-grant

GUIDELINES IN PRACTICE

From Classroom to Creek

In Oakland, California, Earth Team Skyline is working with Friends of Sausal Creek[2] to remove invasive plants, plant native species, and test water quality for contaminants like pesticides, detergents, and pet waste.[3] Students will also conduct a research project to assess public awareness of these contaminants and create outreach materials to emphasize the harm they cause.

Photo credit: © Noah Slager

In Richmond, California, students will work alongside the Contra Costa Resource Conservation District[4] and the City of San Pablo on a year-long initiative involving data collection, restoration, and cleanup activities across various city sites. Through GIS-powered litter mapping, students will track trash generation over time, providing insights to inform city policymakers about how litter migrates to creek areas.

In the cities of Pittsburg and Antioch, California, Earth Team interns are partnering with Friends of Marsh Creek[5] on riparian corridor restoration projects and litter cleanups. California has lost 95% of its original riparian habitat due to development, channelization, and land conversion, so these projects engage students as frontline advocates for biodiversity in these sensitive areas.

Their Meaningful Watershed Educational Experiences evolve through student leadership and expertise. Students shape their projects to maximize both environmental impact and personal relevance. Their hands-on engagement with local ecosystems transforms them into knowledgeable advocates, ready to inspire and guide their communities toward a sustainable future. Through this direct involvement, these young leaders

Photo credit: © Jamie Skillen

not only learn about watershed protection—they create movement that ripples through their communities, generating waves of positive change for generations to come.

Written by Noah Slager, program manager at Earth Team. For more information about Earth Team, visit: https://www.earthteam.net/

[2] For more information about Friends of Sausal Creek, visit: https://www.sausalcreek.org
[3] Earth Team. Science in Action: Skyline Testing Soil for Pollutant Impacts. 2021.
   Retrieved from https://www.earthteam.net/science-in-action-skyline-testing-soil-for-pollutant-impacts/
[4] To learn more about the Contra Costa Resource Conservation District, visit: https://www.ccrcd.org/
[5] To learn more about the Friends of Marsh Creek Watershed, visit: https://www.fomcw.org/fomcw/

Key Characteristic #6:

Implementing Environmental Education

Key Characteristic #6

Implementing Environmental Education

Through their instructional practices, educators create supportive, safe, relevant, and responsive learning environments that are welcoming to the whole learning community. Educators maximize active learning about the environment and environmental concerns. They facilitate the investigation of environmental concerns and exploration of possible solutions and actions in a manner appropriate for their learners, their context, and their community. Educators provide opportunities for action taking of the learners' choosing.

6.1 Instructional methods

Educators employ a range of instructional methods that are particularly suited to environmental education.

- Use a variety of instructional methods and strategies appropriate for the environmental education content and context, learning objectives, learner characteristics, time requirements, involvement of community members, community dynamics and policies, available resources, and instructional setting.
- Apply instructional principles and techniques that create effective, positive, and developmentally appropriate environments for all learners. Include, with respect and dignity, the assets and strengths of a broad array of communities and perspectives.
- Select and implement instructional strategies that engage learners in activities that develop the personal awareness and conceptual understandings needed for evidenced-based, environmental decision-making and action.
- Engage learners in using a broad range of skills, including those for exploring the environment, systems thinking, investigating different perspectives, decision-making, and addressing environmental challenges and opportunities.
- Incorporate opportunities for learners to have firsthand experience exploring the world around them that increase their awareness of—and enthusiasm for—the natural and built environment. Support the development of empathy and respect for nature.
- Engage learners in taking responsibility for their learning and expectations for achievement.
- Convey a sense of the importance and excitement of the content.

GUIDELINES IN PRACTICE

The Magic of a Mini-Meaningful Watershed Education Experience (MWEE)

What if you had a space where formal and nonformal educators could learn best practices, experience a variety of ecosystems, collaborate, and dream of future possibilities? That is just what happened at a recent professional development workshop that the Galveston Bay Foundation (GBF) hosted to round out the Watershed Leaders project as part of the NOAA 21st Century Community Learning Centers (CCLC) Watershed STEM Education Partnership Grant[1]. Formal and nonformal educators across the Houston region came together at GBF's Trinity Bay Discovery Center in Beach City, Texas, to learn more about local watersheds and how to implement NOAA's Meaningful Watershed Education Experience (MWEE) program.

"I really enjoyed the hands-on activities! And it was awesome to network and get to know everyone."

—Participant

Eucators began their day by building a topographic model of the Galveston Bay Watershed and discussing how human and environmental factors can affect the watershed. This lesson, designed by GBF, can be found in the Teacher Resources[2] section of our website. To learn how to implement a MWEE, educators dove into the four essential elements, broke each one down, and discussed various perspectives of the teacher, students, and community partners. Once they understood the elements of the MWEE, educators practiced implementing a mini-MWEE from start to finish.

Four Essential Elements of a Meaningful Watershed Education Experience (MWEE)[3]

- Driving question
- Field experiences
- Analysis and conclusions
- Action project

[1] NAAEE, in collaboration with NOAA and supported by the U.S. Department of Education, is working with twelve environmental education organizations to offer engaging after-school watershed-focused STEM (science, technology, engineering, and mathematics) programs. The eeBLUE 21st Century Community Learning Centers Watershed STEM Education Partnership Grants, support environmental education organizations collaborating directly with 21st CCLC sites. For more information, visit: https://naaee.org/programs/eeblue/watershed-stem-education-partnership-grant

[2] To learn more about GBFs Teacher Resources, visit: https://galvbay.org/work/education/#teacher-resources

[3] To learn more about NOAA Meaningful Watershed Education Experience, visit: https://www.noaa.gov/education/explainers/noaa-meaningful-watershed-educational-experience

GUIDELINES IN PRACTICE

The Magic of a Mini-Meaningful Watershed Education Experience (MWEE)

With "How healthy is the ecosystem at the Trinity Bay Discovery Center?" as their driving question, educators donned water shoes and boots and entered the water. The goal? To identify aquatic species and collect water quality data. Some were novice seiners while others were quite experienced. The mixture of levels was magical, with experts assisting and providing support and the beginners giving new life to everyone present. People always talk about the spark seen in a child's eye when they touch a fish or hold a crab for the first time, but trust me, you can see the same spark in adults, too! Everyone's faces lit up when we caught not one, but two juvenile flounders in one pass. Not even the rain could diminish the flame of interest and inspiration.

Despite dark clouds and rain, seining was the highlight of the field experience portion of the mini-MWEE. Educators also collected and identified insects in the grasses along the edge of the property and discussed water quality results, including why certain parameters weren't as expected. Overall, they determined that the ecosystem is healthy despite being so close to human development. Back inside, small groups brainstormed action project ideas and shared them with the group.

"I loved the breakout group time to delve into the four different aspects of the MWEE. Really appreciated the conversation about larger grants being organized in this manner as well."

—Participant

The act of completing a mini-MWEE allowed educators to experience the program from a student's perspective. Reflection throughout the process allowed participants to suggest additional or alternative ways to collect data, pose follow-up questions, and network with each other. We finished the day by discussing the roles of class-room teachers as well as the various roles that environmental education organizations can play in the MWEE experience. Emphasis was placed on allowing student voice throughout the process, working with community partners, thinking outside the box, consulting with teachers before creating a new program, and writing grants. All in all, every participant stated that they now plan to incorporate MWEEs into their classroom or organization this school year. It is exciting to think that one workshop has the potential to change so many lives—educators and students alike. All you need is a little bit of animal magic, some afternoon chocolate, space to collaborate, and a great program like the MWEE!

Written by Cindy Wilems, director of education at Galveston Bay Foundation. For more information about the Galveston Bay Foundation, visit: https://galvbay.org/

6.2 Collaborative and welcoming learning environment

Educators maximize learning by creating an open, collaborative, and welcoming environment for all learners. Educators foster a positive learning environment, including interaction among learners, that is engaging, supportive of relationship-building, intellectually stimulating, and motivating.

- Identify and use ways to encourage flexibility, creativity, and openness. Consider the assumptions and interpretations that influence the conclusions learners and others draw about the environment, environmental experiences, and environmental concerns.
- Implement techniques that foster independent and productive group work. Draw connections between collaborative work and the ability to function as responsible, engaged, and effective community members.
- Demonstrate respect for learners as individuals with a variety of perspectives and interests. Adjust instructional practices to meet the needs of different ages, audiences, and communities.
- Display enthusiasm, respect, care, fairness, and warmth, and support the learners' social, emotional, and physical needs.
- Provide opportunities to explore local environmental settings (e.g., local parks, neighborhoods, community centers, farms) to ensure educational experiences are personally relevant and meaningful to learners.
- Demonstrate concern and offer alternatives for the learners' physical and emotional safety, especially during education experiences that take place outside, are in unfamiliar settings, or relate to controversial issues and strongly held beliefs. Provide orientations or ground rules in situations or locations that might be unfamiliar or uncomfortable.
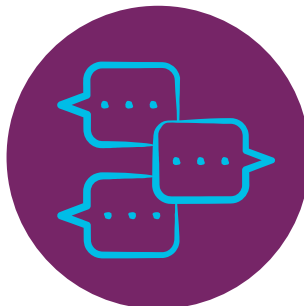
6.3 Inquiry-based

Educators implement experiences that are learner-focused. Educators respond to learners' interests and ways of knowing. Educators provide opportunities for learners to investigate the causes, impacts, and possible solutions for environmental issues of their own choosing.

- Provide opportunities for authentic, experiential exploration of the environment, environmental concerns, and possible environmental solutions. For example, provide opportunities for learners to collect, analyze, and evaluate their own data and draw conclusions.
- Facilitate activities that build personal and community environmental connections, including with people directly affected by environmental concerns.
- Offer ways for learners to make choices about the educational process, express themselves, provide leadership, collaborate, share their knowledge, take responsibility for their own learning, and reflect on their experiences.
- Provide opportunities for relevant and responsive inquiry and investigation, especially when considering controversial environmental concerns that require learners to reflect on their own and others' perspectives.
- Focus instruction based on learner interests, different ways of knowing, and an assessment of learner readiness for the concepts and skills to be presented.

DID YOU KNOW?

Learner-Centered Instruction

Learner-centered or learner-directed instruction centers the learning experience on the learners' needs, interests, and abilities. Learners actively set learning goals, identify resources and strategies for achieving them, and assess their progress. This approach emphasizes active learning, critical thinking, and problem-solving skills.

In learner-centered instruction, the educator serves as a facilitator or guide rather than an authoritative figure. The educator creates a supportive learning environment and provides opportunities for learners to explore and discover knowledge through their efforts.

Learner-centered instruction is based on the idea that learners are more motivated and engaged when they have a sense of ownership and control over their learning. It allows learners to pursue their interests and goals in a way that is personally meaningful to them and encourages them to take responsibility for their learning.

Here are some **key features of learner-centered instruction**.

- **Active participation**: Learners are encouraged to actively participate in the learning process, to ask questions, and to engage in discussions and debates.
- **Collaboration**: Often involving group work, learners work together, share their knowledge and ideas, solve problems, and complete tasks.
- **Real-world relevance**: Learner-centered instruction emphasizes the importance of connecting learning to the real world, which can be achieved by using real-world examples and projects.
- **Individualized learning**: Each student's needs and abilities are taken into account, and instruction is tailored to meet their unique needs.
- **Self-directed learning or learner choice**: Learners are given the freedom and responsibility to direct their learning, with the educator serving as a guide. Learners make choices about what they learn, how they learn, and how they demonstrate their learning.
- **Assessment, reflection, and self-evaluation**: Learners reflect on their learning and identify areas for improvement. Educators use assessment primarily to support learning rather than to measure it, providing feedback to learners on their progress and helping them identify areas where they need further development.
- **Supportive Environmen**t: Learner-centered instruction requires a supportive environment where learners feel comfortable taking risks and making mistakes. Educators play an important role by providing encouragement and positive feedback.

6.4 Exploration of worldviews and perspectives

Educators engage learners in exploring their worldviews and perspectives as well as the worldviews and perspectives of other learners and community members.

- Engage learners in an exploration of differing worldviews concerning community resilience practices that might lead to sustainable futures.
- Provide opportunities for learners to experience first-person narratives and stories that explore perspectives, knowledge systems, and resilience practices of communities with environmental concerns.
- Support learners as they investigate environmental concerns and consider evidence from different ways of knowing, including Indigenous Knowledges and local knowledge. For example, provide opportunities for people who are knowledgeable about relevant fields and who represent differing points of view to share their experiences and wisdom through materials or direct communication with learners.
- Facilitate deliberative discussions where learners can weigh options to address environmental issues, including varying economic, political, and technological options.
- Support learners as they listen actively to the thoughts and perspectives of others, including being open to multiple ways of expression.

6.5 Promotion of civic engagement and action

Educators promote a sense of personal and civic responsibility. They encourage learners to use their interests, knowledge, skills, and assessments as a basis for designing and implementing environmental action strategies for issues of their choosing.

- Guide learners as they build a detailed understanding of their community, including community assets, relationships, aspirations, needs, geographic boundaries, landforms, waterways, infrastructure, cultures, and demographic characteristics.
- Facilitate the identification of key individuals, organizations, and communities of interest that can help guide an understanding of issues and potential solutions.
- Assist learners as they build partnerships and collaborative relationships and explore community concerns about possible environmental actions.
- Support learners as they review evidence of local impacts and future projections of environmental issues, consider community perspectives, and select an issue or concern they want to address (e.g., loss of biodiversity, food insecurity, neighborhood flooding).
- Guide learners as they select a civic action goal and plan a strategy for achieving it. Learners critique alternative solutions and courses of action and determine how they and their partners will decide which action strategies to pursue.
- Provide opportunities for learners to participate in individual and collective action of their own choosing. Ensure opportunities for leadership to develop among learners.
- Support learners and their partners as they amplify and elevate their successes. Provide opportunities for learners to assess the impact of their action strategy, reflect on the effects of their actions, consider unintended consequences, and weigh what, if anything, they would do differently.

6.6 Flexible and responsive instruction

Educators augment proper planning with the flexibility that allows them to meet the needs and interests of learners and take advantage of new instructional opportunities.

- Modify instructional plans and approaches to take advantage of unexpected opportunities and learner questions and interests.
- Provide multiple points of engagement, reaching learners where they are comfortable.
- Blend a variety of instructional methods and activities to meet instructional objectives. Make intentional and meaningful transitions from one program component to another, ensuring clear connections.
- Work collaboratively with other instructors and discipline areas, adapting instructional approaches as needed to blend or complement instructional styles and to meet shared environmental education goals.
- Create a climate where learners are intellectually stimulated and motivated to learn about their environment.

GUIDELINES IN PRACTICE

Tackling Food Waste

In Evergreen, Colorado, the Evergreen Middle School (EMS) Green Team tackled one of the leading problems in their community: food waste. When you live in a small mountain town, you see firsthand how food waste causes an increase in unsafe wildlife behavior. An increase in deadly wildfires and the resulting habitat loss have contributed to increased negative wildlife interactions, mainly with local fauna looking for food scraps in dumpsters and residential trash bins.

With guidance from their teacher, Julia Fliss, the Green Team students used the Earth Force Process to become more informed and take civic action. After conducting research and partnering with key community organizations, including the Evergreen Sustainability Alliance, A1 Organics, and the Denver Zoo, the students came up with a plan to ask for a change at a local level. They developed two strategies to reduce the amount of food being thrown away during lunch at their school: (1) a composting and recycling program led by students to divert food waste and recyclables from the landfill, and (2) they requested that recess be shifted to before lunch, so students are more inclined to finish their lunch. Through their efforts, they successfully diverted an impressive 20 to 30 pounds of food waste per day from the landfill!

Beyond their school, the EMS Green Team is committed to spreading awareness and inspiring others to ask for change. They have been actively presenting their program to elementary and high school students and staff, sharing their strategies and successes in reducing food waste. Their goal is to expand their initiative beyond the school, creating a broader culture of sustainability within the community. By engaging younger and older students alike, they are fostering a lasting commitment to environmental stewardship and ensuring that their food waste reduction efforts continue to grow.

Ms. Fliss was trained in Environmental Action Civics in 2023 by Earth Force.

"We've been busy keeping up with all of the momentum we've created it's literally taken us until today to finalize our process! We won a Sustainability Award from the Jefferson County Board of Commissioners and are taking out action to the school district next. Thank you so much again for all you do!" Ms. Julia Bliss, teacher

For more information about Earth Force and to access their resources, visit: https://earthforce.org/
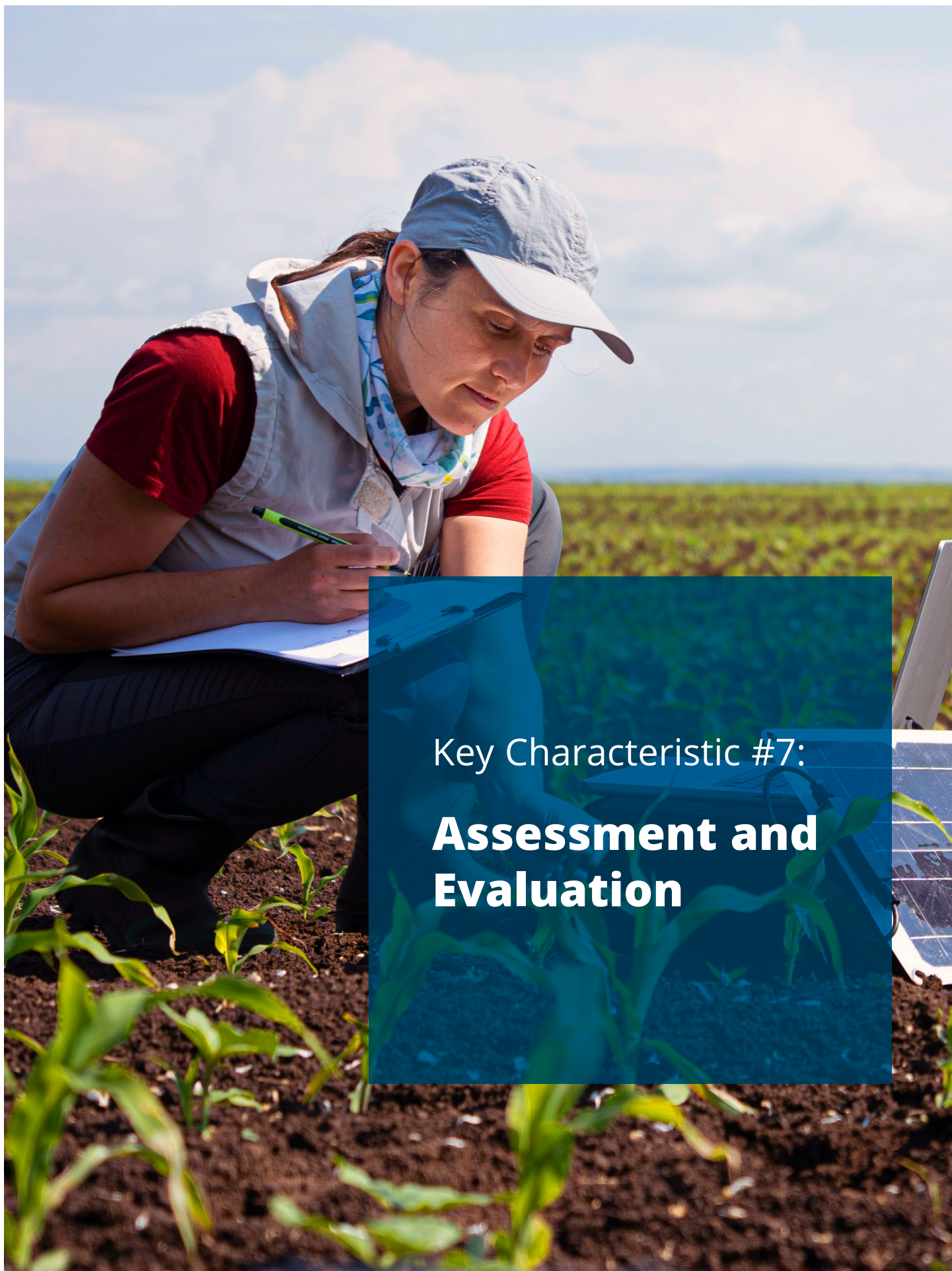
Key Characteristic #7:

Assessment and Evaluation

Key Characteristic #7

Assessment and Evaluation

Educators possess the knowledge, abilities, and commitment to make assessment and evaluation integral to instruction and programs. Educators are familiar with tools for assessing learner progress and evaluating the effectiveness of their own programs.

7.1 Outcomes: Plan with the end in mind

Educators identify intended outcomes as they plan programs.

- Differentiate between program or lesson outputs, outcomes, and impacts and explain how they relate to program or lesson goals and objectives.
- Clearly list measurable program or lesson outcomes that are tied to the goals and objectives of environmental education.
- Identify outcomes that address national, tribal, state/provincial, and local standards.
- Engage learners in setting their own expectations for achievement. Discuss the importance of these abilities in light of environmental education's emphasis on learner-centered education and lifelong learning.
- Demonstrate the ability to write a program or grant proposal that describes the need for the program, lists goals and objectives, identifies intended audiences, clearly states the work that will be completed along with intended outcomes, and evaluation methods that will be used to measure success.

- See **Resource #16,** page 126, to learn about how evaluation feeds into program improvement, including logic models, inputs, outputs, and outcomes.

7.2 Learner assessment that is part of instruction

Educators are familiar with ways of incorporating assessment into environmental education.

- Develop and use a variety of strategies for assessing learner outcomes that reflect applicable subject area standards and environmental education goals and objectives.
- Make objectives and other expectations clear to learners at the outset of an environmental education activity or instruction.
- Identify and use appropriate diagnostic assessment techniques that assess learners' baseline understandings and skills at the beginning of environmental education programs, lessons, and units. Use these diagnostic assessment results when considering learner outcomes.
- Develop and use a variety of strategies for assessing learner outcomes that reflect the developmental level of the learner (e.g., young children, youth, adults).
- Identify techniques for encouraging learners to assess their own and others' work.
- Demonstrate familiarity with specific performance-based assessments such as portfolios, open-ended questions, oral reports, group or independent research, or other projects appropriate to environmental education instruction.
- Practice flexibility when using assessments. If an assessment strategy is not working as planned, consider developing new assessments.

DID YOU KNOW?

Types of Learner Assessment

Assessment

Assessment refers to the wide variety of methods or tools that educators use to evaluate, measure, and document the academic readiness, learning progress, skill acquisition, or educational needs of students.

Source: Great Schools Partnership. Assessment. The Glossary of Education Reform. 2015.
Retrieved from https://www.edglossary.org/assessment/

Learner assessments take place at different times during instruction. Each has a distinctive purpose. Here are six types of assessment as described by Strobel Education:

1. **Diagnostic assessment.** Diagnostic assessment, often used at the beginning of a new unit or term, helps educators identify students' prior knowledge, skills, and understanding of a particular topic.

   This type of assessment enables teachers to tailor their instruction to meet the specific needs and learning gaps of their students.

2. **Formative assessment.** [Formative assessment] focuses on monitoring student learning during the instructional process. Its primary purpose is to provide ongoing feedback to both teachers and students, helping them identify areas of strength and areas in need of improvement.

3. **Summative assessment.** Summative assessments are designed to evaluate student learning at the end of a specific instructional period. These assessments are often used to determine a student's mastery of the content or skills taught and to assign grades or determine readiness for the next level of instruction.

4. **Performance-based assessment.** Performance-based assessment is a type of evaluation that requires students to demonstrate their knowledge, skills, and abilities through the completion of real-world tasks or activities.

   The main purpose of this assessment is to assess students' ability to apply their learning in authentic, meaningful situations that closely resemble real-life challenges.

5. **Self-assessment.** Self-assessment is a valuable tool for encouraging students to engage in reflection and take ownership of their learning. This type of assessment requires students to evaluate their own progress, skills, and understanding of the subject matter. By promoting self-awareness and critical thinking, self-assessment can contribute to the development of lifelong learning habits and foster a growth mindset.

6. **Peer assessment.** Peer assessment, also known as peer evaluation, is a strategy where students evaluate and provide feedback on their classmates' work. This type of assessment allows students to gain a better understanding of their own work, as well as that of their peers.

Source: Strobel Education. 2023. "Assessing Student Learning: 6 Types of Assessment and How to Use Them." Retrieved from https://strobeleducation.com/blog/assessing-student-learning-6-types-of-assessment-and-how-to-use-them/

7.3 Program evaluation

Educators understand the importance of evaluating environmental education programs, are familiar with basic evaluation approaches, and know how to use evaluation results for program improvement.

- Recognize the value of program evaluation (including needs assessment, formative evaluation, and summative evaluation) in informing program design and implementation.
- Discuss reasons for evaluating environmental education programs.
- Describe a variety of data collection methods, both quantitative and qualitative, suitable for evaluating environmental education programs.
- Develop a plan for integrating evaluation into the overall program design process using criteria such as those suggested in *Environmental Education Programs: Guidelines for Excellence*.
- Use evaluation findings to report success in meeting program objectives when writing program and/or grant reports.
- Look for progress and celebrate it as a way to renew and strengthen the program.

DID YOU KNOW?

Types of Evaluation

Evaluation is integral to the overall program planning process. But what is evaluation?

Program evaluation is a systematic method for collecting, analyzing, and using information to answer questions about projects, policies, and programs, particularly about their effectiveness and efficiency. This definition focuses on the question of whether the program, policy or project has, as indicated, the intended effect. However, equally important are questions such as how the program could be improved, whether the program is worthwhile, whether there are better alternatives, if there are unintended outcomes, and whether the program goals are appropriate and useful.

Source: Definitions.net. 2024. "Program Evaluation."
Retrieved from https://www.definitions.net/definition/program+evaluation

Each program development phase and each type of evaluation helps you answer a different set of questions, and each is designed to help you continuously improve your program. The following descriptions may help you sort through some of the different types of evaluation.

Front-End Evaluation or Needs Assessment

Front-end evaluation (sometimes referred to as a needs assessment or planning evaluation) is used to guide the development of a program. It often involves studying a problem, situation, or issue to find out if a program is needed or how it should be framed. Front-end evaluation can also be used to identify gaps between your audience's current level of knowledge, attitudes, skills, and behavior and the level that is desired. In addition, it can be used to guide the development of new programs by helping to determine the characteristics or needs of an audience, define program goals and objectives, and identify potential stakeholders. As its name suggests, a front-end evaluation usually takes place prior to or at the very early stages of developing a program. Front-end evaluations are generally conducted for or used by those who will be developing the program.

Source: Ernst, J.A., M.C. Monroe, and B. Simmons. 2009. *Evaluating Your Environmental Education Programs: A Workbook fo Practitioners.* Washington, DC: NAAEE.

DID YOU KNOW?

Types of Evaluation

Goals-Based Evaluation

Often, programs are established to meet one or more specific goals. These goals are often described in the original program plans. Goal-based evaluations are evaluating the extent to which programs are meeting predetermined goals or objectives.

Process-Based Evaluations

Process-based evaluations are geared toward fully understanding how a program works—how it produces the results that it does. These evaluations are useful if programs are long-standing and have changed over the years, employees or customers report a large number of complaints about the program, or there appear to be large inefficiencies in delivering program services. They are also useful for accurately portraying to outside parties how a program truly operates (e.g., for replication elsewhere).

Source: McNamara, C. 2002. *Basic Guide to Program Evaluation.*
Retrieved from https://www.tgci.com/sites/default/files/pdf/A%20Basic%20Guide%20to%20Program%20Evaluation.pdf

Outcome Evaluation

[Outcome evaluation] investigates to what extent the program is achieving its outcomes. These outcomes are the short-term and medium-term changes in program participants that result directly from the program. For example, EE outcome evaluations may examine improvements in participants' knowledge, skills, attitudes, intentions, or behaviors.

Impact Evaluation

[Impact evaluation] determines any broader, longer-term changes that have occurred as a result of the program. These impacts are the net effects, typically on the entire school, community, organization, society, or environment. EE impact evaluations may focus on the educational, environmental quality, or human health impacts of EE programs.

Source: Zint, M. 2008. "My Environmental Education Evaluation Resource Assistant."
Retrieved from https://meera.seas.umich.edu/

Additional Resources:

• Clavijo, K. and K. Khalil. 2020. *Practical Evaluation for Conservation Education and Outreach: Assessing Impacts and Enhancing Effectiveness*. Rowman & Littlefield Publishers.

• eeVAL: Values-Based Environmental Education Evaluation, https://evaluation.naaee.org/

• W.K. Kellogg Foundation. 2017. "The Step-by-Step Guide to Evaluation: How to Become Savvy Evaluation Consumers." Retrieved from https://evaluationguide.wkkf.org/

7.4 Improving instruction, program design, and materials

Educators consistently use their instructional experiences, assessments, and evaluation results to improve future instruction.

- Organize, interpret, and use the results of assessments and evaluations to help modify and improve current and future programming.
- Pilot test instruction and use the results to refine the program materials and program practices.
- Demonstrate a willingness and ability to collect additional information from and about learners to help modify and improve future instruction.
- Seek opportunities to reflect, individually and with colleagues, on instructional practices and the broader practice of environmental education within the field.
- Share assessment and evaluation results, as appropriate, with learners and in professional settings.
- Celebrate with collaborators and partners, share progress, and tell the story of your program.

RESOURCES YOU CAN USE

eePRO

eePRO is NAAEE's online platform for environmental education professional development, offering a searchable bank of resources (lesson plans, journal articles, reports, videos), a listing of learning opportunities (webinars, on-line courses, workshops, conferences), a higher education database, and much more.

eeBLUE

Stories and case studies from eeBLUE—a partnership between NOAA and NAAEE to increase environmental and science literacy

eePRO Groups

A discussion platform where individuals can join special interest groups, network, and discuss key issues related to environmental education

eeLEARN

A series of online learning modules exploring the foundations of environmental education

eeNEWS

A biweekly e-newsletter, providing the latest news, opportunities, and resources for the environmental education community

eeRESEARCH

A searchable library of research summaries and syntheses focusing on environmental education and connecting people to nature.

eeWORKS

Research reviews and tools for illustrating the value and impacts of environmental education

PRO Picks

A curated listing of educational resources recommended by experts in environmental education

Access all these eePRO resources by visiting https://naaee.org/eepro

RESOURCES YOU CAN USE

## The National Project for Excellence in Environmental Education

The North American Association for Environmental Education (NAAEE) launched the National Project for Excellence in Environmental Education to help educators develop and deliver high-quality education programming. The project works to create more environmentally literate community members with the knowledge, skills, and inclinations to make informed choices and exercise the rights and responsibilities of members of a community.

NAAEE has published seven sets of guidelines that promote the use of balanced, scientifically accurate, and comprehensive environmental education materials and programs that advance environmental literacy and civic engagement. Publications created by the National Project for Excellence in Environmental Education include:
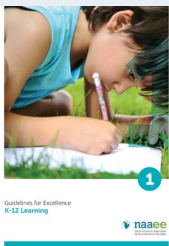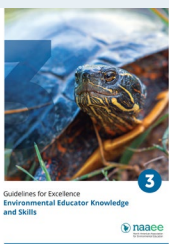
K–12 Environmental Education: Guidelines for Excellence (2019). A comprehensive framework for environmental education, demonstrating benchmarks towards environmental literacy.
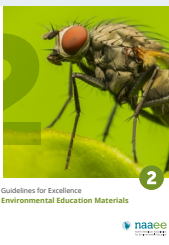
Environmental Education Materials: Guidelines for Excellence (2021). A set of recommendations for developing and selecting environmental education instructional materials.

Environmental Educator Knowledge and Skills (2025). A set of competencies for educators preparing to teach environmental education in a variety of settings.
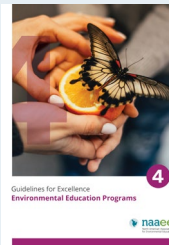
Environmental Education Programs: Guidelines for Excellence (2022). A set of recommendations to be used in the development of comprehensive environmental education programs or to inform improvements in existing ones.
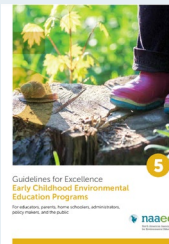
Early Childhood Environmental Education Programs: Guidelines for Excellence (2016). A set of recommendations to be used in the development of comprehensive early childhood environmental education programs or to trigger improvements in existing ones.
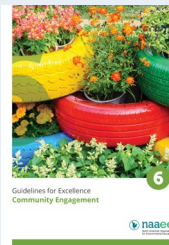
Community Engagement: Guidelines for Excellence (2017). A set of guidelines focused on community wellness and designed to help environmental educators create inclusive environments that support effective partnerships and collaborations.

Educating for Climate Action and Justice: Guidelines for Excellence (2024). A set of guidelines designed to assist educators in developing and implementing effective programs that focus on climate change, address injustice, and ignite action.

You can download free pdfs of these publications or purchase hard copies from NAAEE at https://eepro.naaee.org/resource/guidelines-excellence-series

Supporting Resources

Supporting Resources

This collection of resources is designed to augment the guidelines, providing background information so you can dive more deeply into environmental education practices that may be unfamiliar. You will see links from specific sections in the guidelines to these resources. Navigate back and forth between the guidelines and the resources.

- **Resource #1**   **Environmental Literacy Competencies**
- **Resource #2**   **Historical and Founding Documents of Environmental Education**
- **Resource #3**   **Educational Movements Related to Environmental Education**
- **Resource #4**   **eeWorks: Evidenced-Based Outcomes of Environmental Education**
- **Resource #5**   **eeLearn: Online Learning Modules for Environmental Education**
- **Resource #6**   ***Community Engagement: Guidelines for Excellence***
- **Resource #7**   **Community Well-Being, Resilience, and Sustainability**
- **Resource #8**   **Approaches to Environmental Education Instruction**
- **Resource #9**   **Learner Development and Motivating Learning**
- **Resource #10**   **Developmentally Appropriate Practices**
- **Resource #11**   ***Environmental Education Materials: Guidelines for Excellence***
- **Resource #12**   **Enhancing Broad Participation in Environmental Education Programs**
- **Resource #13**   ***Environmental Education Programs: Guidelines for Excellence***
- **Resource #14**   **Civic Engagement**
- **Resource #15**   **Positive Learning Environment Observation Checklist**
- **Resource #16**   **Connecting Program Design, Evaluation, and Improvement**
- **Resource #17**   ***Practitioner Guide to Assessing Connection to Nature***

Resource #1

Environmental Literacy Competencies

Designing and implementing instruction focused on developing environmental literacy is a primary goal of environmental education. To help educators in this work, NAAEE has written a series of publications that articulate the competencies needed to make well-informed choices and exercise the rights and responsibilities of community members at different age levels.

Importantly, each publication provides a roadmap for environmental educators as they develop their own environmental literacy. At a minimum, educators should strive to possess a working knowledge of the understandings, skills, and attitudes associated with environmental literacy for the development level they will be teaching.

Early Childhood Environmental Education Programs: Guidelines for Excellence

These Guidelines for Excellence offer a set of recommendations for developing comprehensive early childhood environmental education programs. In addition to offering guidance on topics such as developmentally appropriate practices, play, and exploration, they outline a learning framework.

Curriculum Framework for Environmental Learning
Young children are provided opportunities to explore their environment and develop knowledge and skills. Educators intentionally foster growth and development across social-emotional, cognitive, physical, and language domains. As the child matures into adulthood, this learning will lead to environmental literacy.

The framework focuses on providing opportunities for the development of:

- Social and Emotional Growth
- Curiosity and Questioning
- Environmental Understandings
- Skills for Understanding the Environment
- A Personal Sense of Responsibility and Caring
- Physical Health and Development
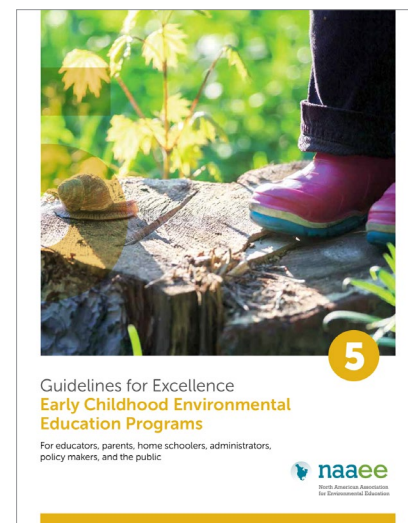
Simmons, B., et al. 2009. Early Childhood *Environmental Education Programs: Guidelines for Excellence.* North American Association for Environmental Education.
Retrieved from: https://eepro.naaee.org/sites/default/files/eepro-post-files/early_childhood_ee_guidelines.pdf

K–12 Environmental Education: Guidelines for Excellence

*K–12 Environmental Education: Guidelines for Excellenc*e offers a vision of environmental education that promotes progress toward sustaining a healthy environment and quality of life. Four organizing strands represent broad aspects of environmental literacy. These strands are further defined by guidelines that articulate knowledge and skill benchmarks in key areas for the end of each of three grade levels—fourth (age 10), eighth (age 14), and twelfth (age 18).

STRAND 1: Questioning, Analysis, and Interpretation Skills
Environmental literacy depends on learners' ability to ask questions, speculate and hypothesize about their surroundings, 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: Environmental Processes and Systems
Environmental literacy depends on understanding the processes and systems that comprise the environment, including human social systems and influences. Students develop an understanding of how changes in one system (hydrosphere, atmosphere, geosphere, and biosphere) result in changes in another. They develop an understanding of how human activities affect environmental quality and long-term sustainability at local, tribal, national, and global levels. These understandings are based on knowledge synthesized from across traditional disciplines. The guidelines in this section are grouped into three sub-categories:

- 2.1—Earth's physical and living systems
- 2.2—Human systems
- 2.3—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 at varying scales. Environmental literacy includes defining, learning about, evaluating, and acting on environmental issues. Students investigate environmental issues; consider evidence and differing viewpoints; and evaluate proposed action plans, including likely effectiveness in specific environmental, cultural, social, and economic contexts. They analyze the intended and unintended consequences of their actions and the actions taken by other individuals and groups, including long-term environmental, social, and economic implications for sustainability. In this section, the guidelines are grouped into two sub-categories:

- 3.1—Skills for analyzing and investigating environmental issues
- 3.2—Decision-making and action skills

STRAND 4: Personal and Civic Responsibility
Environmentally literate community members are willing and able to act on their conclusions about what could be done to ensure sustainability. As learners develop and apply concept-based learning and inquiry, analysis, and action skills, they also understand that what they do individually and in groups can make a difference.

Simmons, B., et al. 2019. *K–12 Environmental Education: Guidelines for Excellence.* North American Association for Environmental Education.
Retrieved from: https://eepro.naaee.org/sites/default/files/eepro-post-files/k-12_ee_guidelines_for_excellence_2019_2.pdf
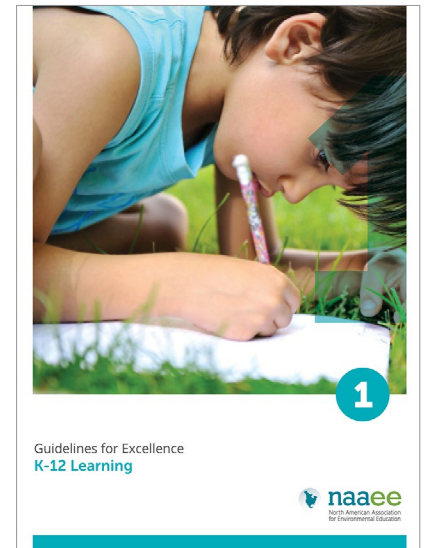
Civic Engagement for Environmental Issues (CEEI)

This learning framework, produced through a partnership between NAAEE and the Kettering Foundation, focuses on Civic Engagement for Environmental Issues (CEEI). The learning framework outlines a critical set of participant outcomes, including learner performance objectives, that can be used to develop comprehensive and cohesive education programs focused on facilitating civic engagement for environmental issues. The framework is organized around four learning domains:

CEEI Knowledge

Individuals develop an understanding of the processes and systems that impact environmental decision-making, including human social, cultural, political, and economic systems. Individuals understand how changes in one system result in changes in another. They understand the reciprocal interrelationship between humans and the environment, including how human activities affect environmental quality and long-term sustainability at various interconnected levels (e.g., local, tribal, national, and global). They use their knowledge to understand power relationships and policy options.

CEEI Skills

Individuals define, learn about, evaluate, and act on environmental and other community issues that impact well-being. Individuals investigate these issues; consider evidence from differing ways of knowing, viewpoints, and value positions; and evaluate proposed action plans, including policy options. They analyze the intended and unintended consequences of their actions, actions taken by other individuals and groups, and actions that impact policy on long-term environmental, social, and economic sustainability.

CEEI Dispositions

Individuals develop a sense of personal and civic responsibility. They are willing and able to act on their conclusions about what could be done to ensure sustainability. They demonstrate self-efficacy and agency, understanding that what they do individually and in groups can make a difference.

CEEI Participatory Action

Individuals gain direct experiences in participatory action-taking. They work individually and collectively, applying the knowledge, skills, and dispositions necessary for taking action that addresses environmental and community issues, including policy issues.

Simmons, B. and M. Monroe. 2020. *The Promise of Civic Engagement for Environmental Issues: Synergy of Environmental Education and Civic Education.* North American Association for Environmental Education.
Retrieved from: https://dg56ycbvljkqr.cloudfront.net/sites/default/files/eepro-post-files/promise_of_ee_and_civic_education__0.pdf

Resource #2

Historical and Founding Documents of Environmental Education

Environmental education has a rich history that builds on traditions spanning millennia. Depending on your perspective, the roots of environmental education can be traced to the ways in which Indigenous peoples around the world share environmental knowledge to such notables as Confucius (551-479 BC), Mencius (372-289 BC), Sima Qian (145-86 BC), Jean-Jacques Rousseau (1712-1778), Louis Agassiz (1807-1873), Wilbur Jackman (1855-1907), and Liberty Hyde Bailey (1858-1954).

The modern era of environmental education began in the mid-twentieth century. The term "environmental education" is believed to have been first mentioned in 1948 at a meeting of the International Union for the Conservation of Nature in Paris, France. The first formal definition of environmental education was published in the inaugural issue of the Journal of Environmental Education (1969).

Founding Documents Of Environmental Education: Stockholm Declaration, Belgrade Charter, & Tbilisi Declaration

Any discussion of the development of environmental education would be remiss if it did not acknowledge the significant contributions of the Stockholm Declaration, Belgrade Charter, and the Tbilisi Declaration. These documents helped to guide environmental education by furnishing internationally accepted goals and objectives.

Stockholm Declaration and Action Plan for the Human Environment (June 1972)

The first United Nations conference focused on the environment was held in Stockholm, Sweden, from June 5-16, 1972. The resulting Stockholm Declaration "placed environmental issues at the forefront of international concerns and marked the start of a dialogue between industrialized and developing countries on the link between economic growth; air, water, and ocean pollution; and the well-being of people around the world."

The Stockholm Declaration included 26 principles and 109 recommendations. For environmental education, Recommendation 96 was particularly important. It recommended that UNESCO "established an international program in environmental education, interdisciplinary in approach, in school and out of school, encompassing all levels of education and directed towards the general public, in particular the ordinary citizen living in rural and urban areas, youth and adult alike." The Stockholm Declaration led directly to the Belgrade Charter.

Source: United Nations. 1972. *Report of the United Nations Conference on the Human Environment*. Stockholm. Retrieved from https://documents.un.org/doc/undoc/gen/nl7/300/05/pdf/nl730005.pdf

Belgrade Charter: A Framework for Environmental Education (October 1975)

Organized by the United Nations Educational, Scientific, and Cultural Organization (UNESCO), the International Workshop on Environmental Education was held in Belgrade, Yugoslavia, from October 13–22, 1975. Participants in the workshop proposed a global framework for environmental education, referred to as the Belgrade Charter. The Belgrade Charter outlined goals, objectives, and principles of environmental education programs:

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 solutions of current problems and the prevention of new ones.

Environmental Education Objectives

The objectives of environmental education are:

1. *Awareness: to help individuals and social groups acquire an awareness of and sensitivity to the total environment and its allied problems*
2. *Knowledge: to help individuals and social groups acquire basic understanding of the total environment, its associated problems and humanity's critically responsible presence and role in it*
3. *Attitude: to help individuals and social groups acquire social values, strong feelings of concern for the environment and the motivation for actively participating in its protection and improvement*
4. *Skills: to help individuals and social groups acquire the skills for solving environmental problems*
5. *Evaluation ability: to help individuals and social groups evaluate environmental measures and education programmes in terms of ecological, political, economic, social, esthetic and educational factors*
6. *Participation: to help individuals and social groups develop a sense of responsibility and urgency regarding environmental problems to ensure appropriate action to solve those problems*

In addition to these objectives, the Belgrade Charter articulated eight principles, proposing that environmental education should:

1. *consider the environment in its totality—natural and man-made, economic, political, economic, technological, social, legislative, cultural and aesthetic*
2. *be a continuous life-long process, both in-school and out-of-school*
3. *be interdisciplinary in its approach*
4. *emphasize active participation in preventing and solving environmental problems*
5. *examine major environmental issues from a world point of view, while paying due regard to regional differences*
6. *focus on current and future environmental situation*
7. *examine all development and growth from an environmental perspective*
8. *promote the value and necessity of local, national and international cooperation in the solution of environmental problems*

Source: UNESCO. 1975. *The Belgrade Charter: A Framework for Environmental Education.*
Retrieved from https://www.eusteps.eu/wp-content/uploads/2020/12/Belgrade-Charter.pdf

Tbilisi Declaration (October 1977)

The Tbilisi Declaration was adopted at the world's first Intergovernmental Conference on Environmental Education organized by UNESCO. Importantly, the conference was a Category II meeting of the United Nations, meaning that the chief participants represented their governments and a report and recommendations were adopted. The Tbilisi Declaration updated and clarified the Belgrade Charter and the Stockholm Declaration.

The Tbilisi Declaration further defined environmental education in terms of lifelong and interdisciplinary learning. It also established the importance of active problem-solving:

> *Environmental education, properly understood, should constitute a comprehensive lifelong education, one responsive to changes in a rapidly changing world. It should prepare the individual for life through an understanding of the major problems of the contemporary world, and the provision of skills and attributes needed to play a productive role towards improving life and protecting the environment with due regard given to ethical values. By adopting a holistic approach, rooted in a broad interdisciplinary base, it recreates an overall perspective which acknowledges the fact that the natural environment and man-made environment are profoundly interdependent. It helps reveal the enduring continuity which links the acts of today to the consequences for tomorrow. It demonstrates the interdependencies among national communities and the need for solidarity among all mankind.*

> *Environmental education must look outward to the community. It should involve the individual in an active problem-solving process within the context of specific realities, and it should encourage initiative, a sense of responsibility and commitment to build a better tomorrow...*

The Tbilisi Declaration set three goals for environmental education:

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

In addition to establishing these goals, the Tbilisi Declaration described five categories of objectives:

1. **Awareness:** *to help social groups and individuals acquire an awareness of and sensitivity to the total environment and its allied problems*
2. **Knowledge:** *to help social groups and individuals gain a variety of experience in and acquire a basic understanding of the environment and its associated problems*
3. **Attitudes:** *to help social groups and individuals acquire a set of values and feelings of concern for the environment, and the motivation for actively participating in environmental improvements and protection*
4. **Skills:** *to help social groups and individuals acquire the skills for identifying and solving environmental problems*
5. **Participation:** *to provide social groups and individuals with an opportunity to be actively involved at all levels in working toward resolution of environmental problems*

Source: UNESCO. 1978. *Intergovernmental Conference on Environmental Education: Final Report.*
Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000032763

Key International Conferences and Reports Since 1978

Since the early defining days of the Stockholm Declaration, Belgrade Charter, and the Tbilisi Declaration, environmental education continues to evolve. Various world conferences and commissions have introduced and elaborated on the notions of sustainable development and education for sustainable development. Each of these has impacted environmental education thinking and practice globally. Some particularly important commissions and conferences include:

World Commission on Environment and Development

Commonly known as the Brundtland Report after the chair of the World Commission on Environment and Development, former Norwegian Prime Minister Gro Harlem Brundtland, Our Common Future defines the concept of sustainable development:

> …development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Source: United Nations World Commission on Environment and Development. Report on the World Commission on Environment and Development: Our Common Future: Report of the World Commission on Environment and Development. Oxford University Press, 1987.

United Nations Conference on Environment and Development

The UN Conference on Environment and Development, commonly referred to as the Earth Summit, was held in Rio de Janeiro in June 1992. The summit, attended by representatives of 179 countries, resulted in the publication of Agenda 21, which has been described as a blueprint for international action on the environment.

Source: United Nations. United Nations Conference on Environment and Development, Rio de Janeiro, Brazil, 3-14 June 1992. Retrieved from https://www.un.org/en/conferences/environment/rio1992'

Following the Earth Summit, the United Nations has convened a series of summits and conferences focused on the environment, sustainable development, and education for sustainable development.

Key conferences include:

• World Summit on Sustainable Development, August 26-September 4, 2002, Johannesburg.
  For more information, visit: https://www.un.org/en/conferences/environment/johannesburg2002
• United Nations Conference on Sustainable Development, June 20-22, 2012, Rio de Janeiro.
  For more information, visit: https://www.un.org/en/conferences/environment/rio2012
• UNESCO World Conference on Education for Sustainable Development, November 10-12, 2014, Nagoya, Japan. For more information, visit: https://unesdoc.unesco.org/ark:/48223/pf0000232888#:~:text=The%20 conference%20was%20well%20attended,(Day%202%20programme)%203.
• UNESCO World Conference on Education for Sustainable Development, May 17-19, 2019, Berlin, Germany. For more information, visit: https://events.unesco.org/event?id=275743948&lang=1033
• Stockholm+50: A Healthy Planet for the Prosperity of All—Our Responsibility, Our Opportunity, June 2-3, 2022, Stockholm, Sweden. For more information, visit: https://www.stockholm50.global/

Environmental Education Histories and Timelines: Selected Resources

Although there have been many different histories and timelines documenting environmental education, here are a few you might find helpful:

- Carter, R. L., & Simmons, B. 2010. "The History and Philosophy of Environmental Education." In *The Inclusion of Environmental Education in Science Teacher Education*, edited by A. M. Bodzin. Retrieved from https://www.researchgate.net/publication/226100365_The_History_and_Philosophy_of_Environmental_Education

- Disinger, J. 2001. "Environmental Education Definitional Problems." In *Essential Readings in Environmental Education*, edited by H. R. Hungerford, W. J. Bluhm, T. L. Volk, & J. M. Ramsey. Champaign, IL: Stipes Publishing.

- eePRO. n.d. "eeLEARN 2: The History of EE." Retrieved from https://eepro.naaee.org/learning/eelearn/eelearn-2-history-ee

- Fang, W.T., Hassan, A. & Le Page, B. 2023. *The Living Environmental Education*. Springer Nature, Singapore. Retrieved from https://link.springer.com/chapter/10.1007/978-981-19-4234-1_2

- Gough, A. 2012. "The Emergence of Environmental Education Research: A 'History' of the Field." in *International Handbook on Research in Environmental Education*, edited by Robert B. Stevenson, Michael Brody, Justin Dillon, and Arjen Wals. Routledge. 2012. Retrieved from https://www.researchgate.net/publication/303333786_The_Emergence_of_Environmental_Education_a_'history'_of_the_field

- Hopkins, C. 2024. *The Story of ESD Since 1992*. York University. Retrieved from https://www.yorku.ca/unescochair/research-expertise/history-of-esd/

- Inwood, H. & Jagger, S. 2014. *DEEPER: Deepening Environmental Education in Pre-Service Education Resource*. Toronto, ON: Ontario Institute for Studies in Education. http://eseinfacultiesofed.ca/practice-pages/deeper.html.

- McCrea, E. 2006. *The Roots of Environmental Education: How the Past Supports the Future*. Retrieved from https://files.eric.ed.gov/fulltext/ED491084.pdf

- UNEP. 1990. *Environmental Education: Selected Activities of UNESCO-UNEP International Environmental Education Programme*, 1975-1990. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000087446

Resource #3

Educational Movements Related to Environmental Education

Environmental education has a rich history, but it has not developed in a vacuum. Enduring aspects of environmental education philosophy and practice have been inspired by:

Conservation Education

> *Conservation Education (CE) helps people of all ages understand and appreciate our country's natural resources—and learn how to conserve those resources for future generations. Through structured educational experiences and activities targeted to varying age groups and populations, conservation education enables people to realize how natural resources and ecosystems affect each other and how resources can be used wisely.*

Source: U. S. Forest Service. n.d. "Conservation Education." Retrieved from https://www.fs.usda.gov/conservationeducation

Education for Sustainable Development

Education for Sustainable Development (ESD) empowers learners to take informed decisions and make responsible actions for environmental integrity, economic viability, and a just society.

> *ESD is a lifelong learning process and an integral part of quality education. It enhances the cognitive, social, and emotional and behavioral dimensions of learning. It is holistic and transformational and encompasses learning content and outcomes, pedagogy, and the learning environment itself.*

> *ESD is recognized as a key enabler of all Sustainable Development Goals and achieves its purpose by transforming society.*

Source: UNESCO. 2019. "What is Education for Sustainable Development?"
Retrieved from https://en.unesco.org/themes/education-sustainable-development/what-is-esd

Experiential Education

> *Experiential education is a teaching philosophy that informs many methodologies in which educators purposefully engage with learners in direct experience and focused reflection in order to increase knowledge, develop skills, clarify values, and develop people's capacity to contribute to their communities.*

Source: Association for Experiential Education. 2025. "What is Experiential Education?"
Retrieved from https://www.aee.org/what-is-experiential-education

Land-Based Education

Land-based learning typically uses an Indigenized and environmentally focused approach to education by first recognizing the deep, physical, mental, and spiritual connection to the land that is a part of Indigenous cultures. Each land-based learning program is unique, and therefore some may use different titles, or may not focus on Indigenous knowledge at all.

Source: Cherpako, D. 2019. "Making Indigenous-Led Education a Public Policy Priority: The Benefits of Land-Based Education and Programming."
Retrieved from https://www.socialconnectedness.org/wp-content/uploads/2019/10/Land-Based-Education-Pamphlet.pdf

Nature Study

Nature study is an educational approach that focuses on observing and learning about the natural world. It emphasizes hands-on experiences in nature to foster a deeper understanding and appreciation for the environment. ... The primary goal of nature study is to help students develop a strong connection to the natural world and cultivate a sense of wonder and curiosity about their surroundings. By engaging in hands-on activities such as observing plants and animals, students can develop important skills such as critical thinking, problem-solving, and scientific inquiry.

Source: Learning Corner. 2025. "Understanding Nature Study in Education." Retrieved from https://learningcorner.co/knowledge-base/glossary/nature-study#:~:text=Learn%20about%20Nature%20Study%20in%20this%20educational%20glossary%20entry.&text=Nature%20study%20is%20an%20educational,and%20appreciation%20for%20the%20environment.

Outdoor Education

That which ought and can best be taught inside the schoolrooms should there be taught, and that which can best be learned through experience dealing directly with native materials and life situations outside the classroom should there be learned.

Source: Sharp, L.B. 1943. "Outside the Classroom." *The Educational Forum*, 7(4), 361–368. Retrieved from http://cornerstone.lib.mnsu.edu/cgi/viewcontent.cgi?filename=28&article=1002&context=books-carlson-sharp&type=additional

Place-Based Education

Place-based education is the process of using the local community and environment as a starting point to teach concepts in language arts, mathematics, social studies, science and other concepts across the curriculum. Emphasizing hands-on, real-world learning experiences, this approach to education increases academic achievement, helps students develop stronger ties to their community, enhances students' appreciation for the natural world, and creates a heightened commitment to serving as active, contributing citizens.

Source: Antioch University. Center for Place-Based Education. 2025. "What Is Place-Based Education?" Retrieved from https://www.antioch.edu/centers-institutes/center-place-based-education/

Progressive Education

Education should focus on the whole child, rather than on the content or the teacher. This educational philosophy stresses that students should test ideas by active experimentation. Learning is rooted in the questions of learners that arise through experiencing the world. It is active, not passive. The learner is a problem solver and thinker who makes meaning through his or her individual experience in the physical and cultural context. Effective teachers provide experiences so that students can learn by doing. Curriculum content is derived from student interests and questions. ...The emphasis is on process—how one comes to know. ...the school should improve the way of life of our citizens through experiencing freedom and democracy in schools. Shared decision making, planning of teachers with students, student-selected topics are all aspects. Books are tools, rather than authority.

Source: Augsburg University. 2006. "Educational Philosophies Definitions and Comparison Chart." Retrieved from https://web.augsburg.edu/~erickson/edc490/downloads/comparison_edu_philo.pdf

Selected Resources:

• Adkins, C. & Simmons, B. 2002. "Outdoor, Experiential, and Environmental Education: Converging or Diverging Approaches?" *ERIC Digest*. Retrieved from https://books.google.com/books?id=ZvDtdWshI30C&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false

• Association of Fish and Wildlife Agencies. 2022. "The North American Conservation Education Strategy: A Tool Kit for Achieving Excellence." Retrieved from https://www.fishwildlife.org/afwa-informs/ce-strategy/north-american-conservation-education-strategy

• Ford, P. 1986. "Outdoor Education: Definition and Philosophy." ERIC Digest. Las Cruces, NM: ERIC Clearinghouse on Rural Education and Small Schools. (ERIC Document Reproduction Service No. ED 267 941). Retrieved from https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=78f61f5e6ece2210e8c994bd3a7b0ba74266ba9c

• Getting Smart. n.d. "What is Place-Based Education and Why Does it Matter?" Retrieved from chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.gettingsmart.com/wp-content/uploads/2020/04/What-is-Place-Based-Education-and-Why-Does-it-Matter-4.pdf

• Tolley, K. 1994. "Study Nature, Not Books": The Nature Study Curriculum 1891-1932. Retrieved from chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://files.eric.ed.gov/fulltext/ED374009.pdf

• UNESCO Canadian Commission. 2021. "Land as Teacher: Understanding Indigenous Land-Based Education. 2021. Retrieved from https://en.ccunesco.ca/idealab/indigenous-land-based-education

Resource #4

eeWORKS: Evidenced-Based Outcomes of Environmental Education

NAAEE is partnering with Stanford University, University of California Davis, and University of Florida to demonstrate the impact and value of environmental education. Using published research literature, comprehensive, systematic reviews have been conducted for several priority topics:

The Benefits of EE and Nature Connections in Early Childhood
Researchers at Stanford University analyzed 66 studies that examined early childhood environmental education outcomes. The findings suggest that early childhood environmental education supports environmental literacy outcomes, as well as other cognitive, social and emotional, and physical development outcomes.

The Benefits of Environmental Education for K–12 Students
Experts at Stanford University systematically searched the academic literature and analyzed 119 peer-reviewed studies published over a 20-year period that measured the impacts of environmental education for K–12 students. The review found clear evidence that environmental education programs provide a variety of benefits. Not surprisingly, the studies clearly showed that students taking part in environmental education programming gained knowledge about the environment. In addition to knowledge gains, studies in the review demonstrated that environmental education enhanced critical thinking skills, personal growth, and life-building skills, including confidence, autonomy, and leadership. In addition, a number of the studies showed that environmental education increased civic engagement and positive environmental behaviors.

Community and Citizen Science Programs Support Environmental Education Outcomes
A research team at the University of California at Davis analyzed 100 articles in the peer-reviewed literature that evaluated community and citizen science (CCS) programs and determined that these programs achieve a variety of environmental education outcomes. The team read and coded each paper for participant impacts. These outcomes include gains in knowledge, positive environmental attitudes, and skills in data analysis and problem solving.

Environmental Education Practices That Support Civic Engagement

Researchers at Stanford University analyzed 56 peer-reviewed studies focused on assessments of how environmental education programs contribute to civic engagement. All 56 (100%) studies in the review reported some level of positive civic engagement outcomes, at the individual level, the community level, or both. In addition, positive environmental and academic outcomes occur alongside civic engagement-related outcomes (34 of 56 studies).

Environmental Education Strategies That Support Positive Youth Development

Researchers at Stanford University analyzed 60 peer-reviewed studies published over a 10-year period to explore how EE contributes to positive youth development (e.g., physical, intellectual, psychological and emotional, and social development).

Identifying Effective Climate Change Education Strategies

University of Florida's analysis of peer-reviewed research revealed that climate change education programs achieve a variety of positive outcomes. Most commonly, programs increase climate knowledge, but they can also impact learners' level of concern about climate change, problem-solving skills, and behaviors. Effective climate change education programs are personally relevant and meaningful, use engaging teaching strategies, encourage deliberative discussion to explore and navigate disagreements and controversial issues, engage participants in the scientific process, address misconceptions, and/or incorporate school or community projects for participants to take action.

The Impact of EE on Conservation and Environmental Quality

Researchers at Stanford University analyzed 105 peer-reviewed studies to assess environmental education's effects on conservation outcomes. The findings suggest that environmental education helps support and sustain a range of conservation efforts, including community conservation work. It engages key audiences and helps people understand, care about, and take effective action on environmental issues.

For more information on the research synthesis projects, visit: https://naaee.org/programs/eeworks

Resource #5
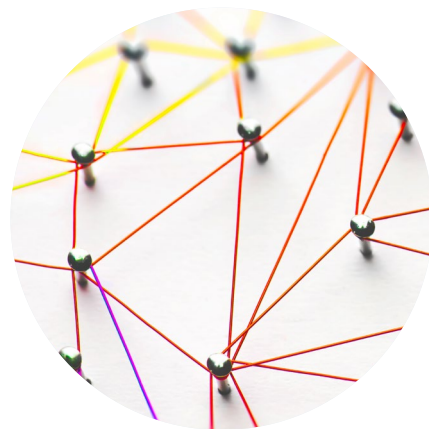
eeLEARN: Online Learning Modules for Environmental Education

eeLEARN is a series of self-paced, online learning modules focused on the foundations of environmental education. eeLEARN offers a diverse range of content that helps educators build the knowledge and skills needed to make a lasting impact. Each module provides a full online learning experience, including reflections, assessments, a completion certificate, and a final report. eeLEARN includes five modules:

What is EE?
Learn about the definition of environmental education, the big ideas of the field, and the relationship between EE and environmental literacy. In this module, participants explore concrete examples of various exciting EE projects and programs from around the world.

The History of EE
In this learning module, participants explore some of the milestones and people who have influenced the field through videos and an interactive timeline. Come on a journey through the history of environmental education.

Research and Evaluation
This module is an introduction to research and evaluation for environmental educators and others working in education. Through case studies and a step-by-step illustration of the evaluation process, participants explore how evaluation can improve EE programs. Participants also look at how research can inform practice and where to go for research summaries and syntheses.

Civic Engagement for Environmental Issues
Learn why civic engagement is an integral part of environmental education and how educators can incorporate civic engagement, designed specifically for environmental issues, into their practice.

Meaningful Watershed Educational Experience (MWEE) 101
Learn about Meaningful Watershed Educational Experiences in this introduction to MWEEs by NOAA.

To access the eeLEARN modules, visit https://eepro.naaee.org/learning/eelearn

Resource #6

Community Engagement: Guidelines for Excellence

No matter where you teach (e.g., school, nature center, zoo, library, youth club), you are teaching within a community. *Community Engagement: Guidelines for Excellence* will help you anchor environmental aims within the context of community interests, issues, and capacities. This set of guidelines focuses on community wellness and is designed to help environmental educators create effective partnerships and collaborations.

Environmental education that successfully engages communities has five key characteristics in common.

Key Characteristic #1: Community Centered
Anchoring environmental aims within the context of community interests, issues, and capacities puts the community at the heart of environmental education.

Key Characteristic #2: Based on Sound Environmental Education Principles
Environmental education engages communities in ways that rely on established principles and proven practices of the field.

Key Characteristic #3: Collaborative
Environmental education works in collaborative relationships, partnerships, and coalitions.

Key Characteristic #4: Oriented Toward Capacity Building and Civic Action
Environmental education supports capacity building for ongoing civic engagement in community life, contributing to long-term community well-being, sustainability, and resilience.

Key Characteristic #5: A Long-Term Investment in Change
Working in communities to create change is typically a long-term initiative, requiring a commitment to relationship building and an ongoing and evolving process of engagement.

A 25-item toolkit augments the guidelines; toolkit resources help users dive more deeply into aspects of environmental education and community engagement that may be unfamiliar to some practitioners.

Simmons, B. et.al. 2017. *Community Engagement: Guidelines for Excellence.* Washington, DC: NAAEE. Retrieved from https://eepro.naaee.org/sites/default/files/eepro-post-files/community_engagement_guidelines_pdf.pdf

Resource #7

Community Well-Being, Resilience, and Sustainability

The quality of our environment is inextricably bound with human health and well-being. Protecting a healthy environment is essential to addressing a broad range of community issues, sustaining community vitality over time, buffering against damage, and adapting to changing conditions such as habitat loss.

However important environmental quality may be, it may not be at the top of everyone's agenda. Although they may see tackling environmental problems as important to community health, many community members and groups are likely to prioritize other issues as starting points for improving community conditions and well-being.

Environmental educators can highlight connections between environmental quality and other aspects of community health. Three related concepts—community well-being, sustainability, and resilience—can help illustrate these connections and forge partnerships among community efforts with compatible aims.

Sustainability—Originally an ecological concept referring to how biological systems endure and remain diverse, sustainability is now commonly used to describe the viability of interdependent human and natural systems over time. The United Nations Brundtland Commission defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[1]

Resilience—The ability of a system, community, or society exposed to hazards to resist, absorb, adapt to, transform, and recover from the effects of a hazard in a timely and efficient manner, including risk management to preserve and restore essential basic structures and functions.[2]

Community well-being—The conditions that maximize the potential for individuals, communities, and societies to flourish and fulfill their potential.[3]

The concepts of sustainability, resilience, and community well-being are united by a common understanding that cultural, social, political, natural, and economic systems are interdependent.

Understand the Interconnecting Systems

There would be little argument that a community's well-being would be in jeopardy if the water were undrinkable or if parts of the population were chronically unemployed. But, as with many complex concerns, the component parts may well be seen as separate issues to be tackled one at a time by individual groups or organizations. Seeing how component systems are interdependent is fundamental to the ideas of community well-being, resilience, and sustainability. All three concepts provide holistic lenses through which to view and connect community dynamics, concerns, and issues that are routinely treated separately by community actors, government agencies, laws, and policies.

This holistic understanding reveals that water quality, for example, is not only an environmental issue. It may well affect how people recreate, whether employers are willing to locate in the community, or the long-term health of families who don't have access to properly treated water or who catch and eat fish from the local river. Understanding the systems and how they are interconnected an help you identify possible synergies, partnerships, and shared goals.

[1] United Nations World Commission on Environment and Development. 1987. Our Common Future: Report of the World Commission on Environment and Development. Retrieved from https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf

[2] United Nations Office on Disaster Risk Reduction. n.d. "Definition: Resilience." Retrieved from https://www.undrr.org/terminology/resilience

[3] Wiseman, John, and Kathleen Brasher. 2008. "Community Wellbeing in an Unwell World: Trends, Challenges, and Possibilities." Journal of Public Health Policy 29, no. 3 (2008): 353-66. doi:10.1057/jphp.2008.16.

Resource #8

Approaches to Environmental Education Instruction

Environmental educators employ many instructional strategies—ranging from lecture and discussion to action research, and from reading assignments to panel discussions and debates. While many methods are useful, these are some instructional methods that are particularly well suited to environmental education content.[1]

Civic Engagement
Learners are actively involved in understanding and addressing community issues, developing the knowledge, skills, and values necessary to participate meaningfully as members of the community.

Cooperative Learning
Learners of various ability levels work in groups and take responsibility for their own and each other's learning.

Community-Based Research and Action Skills
Learners conduct research collaboratively with community members, where the goal is not just to gather data, but to actively work together to identify issues, develop solutions, and implement actions for positive change.

Conferencing
A purposeful, one-on-one conversation between a staff member and a learner.

Deliberation
Learners actively discuss complex issues, carefully considering multiple perspectives, weighing evidence, and aiming to reach a well-informed conclusion through respectful dialogue.

Discovery
Learning by doing. Learners participate in exploration, question-asking, problem-solving, and reflection.

Experiential Learning
Learners gain knowledge and skills through direct experience, reflection, developing generalizations from the experience, and testing the implications of the generalizations (sometimes referred to as learning by doing).

Inquiry
Learners ask questions, investigate, and form their own conclusions.

Learner-Directed
Learners take initiative in their learning as they determine their own needs, formulate goals, and identify learning resources.

Nonlinguistic Representation
Objects, signs, or nonverbal strategies that encourage and remind learners to make responsible decisions.

Observation
Learners use their senses to notice, analyze, and remember their surroundings.

Project-Based Learning and Problem-Based Learning
A learner-directed approach that allows learners to engage in open-ended projects or problems, in collaboration with other students, around areas of interest or need.

Self-Reflection or Self-Assessment
Learners think individually about who they are, what they want, what they've learned, what they need, and so forth.

Service Learning
Experiential opportunities that link learning to service, volunteering, or work.

Simulations
Learners are immersed in realistic scenarios to help them learn and practice skills.

Storytelling
Uses narrative to help learners engage with and understand new information.

Think-Alouds or Self-Talk
The act of making your thought process "visible" to others as you solve a problem, learn a new concept, or respond to a difficult situation.

[1] Many of these learning approaches were adapted, with permission, from You for Youth. n.d. "Delivery Methods for Social and Emotional Learning." Retrieved from https://y4yarchives.org/index.php/en/tools/delivery-methods-for-social-and-emotional-learning

5E Instructional Model

The 5E instructional model, developed by Biological Sciences Curriculum Study (BSCS) in 1987, promotes active, collaborative learning in which participants ask questions, observe, analyze, and draw conclusions. Designed to facilitate conceptual change, the instructional model centers around five phases: engagement, exploration, exploration, elaboration, and evaluation. Bybee, et. al. summarize the five phases as follows:

Engagement—The teacher or a curriculum task accesses the learners' prior knowledge and helps them become engaged in a new concept through the use of short activities that promote curiosity and elicit prior knowledge. The activity should make connections between past and present learning experiences, expose prior conceptions, and organize students' thinking toward the learning outcomes of current activities.

Exploration—Exploration experiences provide students with a common base of activities within which current concepts or misconceptions, processes, and skills are identified and conceptual change is facilitated. Learners may complete lab activities that help them use prior knowledge to generate new ideas, explore questions and possibilities, and design and conduct a preliminary investigation.

Explanation—The explanation phase focuses students' attention on a particular aspect of their engagement and exploration experiences and provides opportunities to demonstrate their conceptual understanding, process skills, or behaviors. This phase also provides opportunities for teachers to introduce a concept, process, or skill directly. Learners explain their understanding of the concept. An explanation from the teacher or the curriculum may guide them toward a deeper understanding, which is a critical part of this phase.

Elaboration—Teachers challenge and extend students' conceptual understanding and skills. Through new experiences, the students develop deeper and broader understanding, more information, and adequate skills. Students apply their understanding of the concept by conducting additional activities.

Evaluation—The evaluation phase encourages students to assess their understanding and abilities and provides opportunities for teachers to evaluate student progress toward achieving the educational objectives.

Source: Bybee, R., J. Taylor, et al. 2006. The BSCS 5E Instructional Model: Origins and Effectiveness. Colorado Springs, CO: BSCS. Retrieved from https://media.bscs.org/bscsmw/5es/ bscs_5e_full_report.pdf

As you explore environmental education instructional models and resources, you may find the following useful:

- BEETLES. Science and Teaching for Field Instructors. Lawrence Hall of Science. 2025.
  Retrieved from https://beetlesproject.org/about/
- Monroe, M. E. Andrews, and K. Biedenweg. 2007. "A Framework for Environmental Education Strategies. Applied Environmental Education and Communication."
  Retrieved from chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://kellybiedenweg.weebly.com/uploads/9/4/0/6/94065145/monroe_et_al_2007.pdf
- NAAEE. 2025. "eeWORKS: From Anecdotes to Evidence: Demonstrating the Power of Environmental Education."
  Retrieved from https://naaee.org/programs/eeworks
- WGU. 2020. "Five Educational Learning Theories."
  Retrieved from https://www.wgu.edu/blog/five-educational-learning-theories2005.html

Resource #9

Learner Development and Motivating Learning

Learner Development: Infancy to Late Adolescence

From birth through adolescence, children and young people grow—they grow physically, socio-emotionally, and cognitively. They develop learning competencies. Teaching a 3-year-old is not the same as teaching a 13-year-old, and the difference isn't just their height. Understanding the stages of child and adolescent development will enhance instruction and learning.

Adapted, with permission, from You for Youth, the following descriptions of child and adolescent development may be useful as a program planning tool:

Infancy to Age 4

This stage of development is typically broken down in three- or six-month increments because changes are so rapid and numerous. Physical development ranges from a child holding up their head all the way to eating and dressing independently. Social and emotional milestones move through phases of caregiver attachment and range from responsive smiling to concern for the feelings of others. Cognitive development begins with information acquisition through the five senses at a swift pace and can range all the way up to pre-reading and writing skills. There is cause for concern if a four-year-old child is not communicating clearly, safely navigating their environment, playing with peers, or using their imagination. The role of caregivers at this stage is central for healthy development (Centers for Disease Control and Prevention, 2021).

Early Childhood: Ages 4–6

The youngest children likely to be in out-of-school time programs are in the early childhood stage of development. Physical milestones include improved manual dexterity, hopping, skipping, and an affinity for stunts. Social and emotional growth might include continuous reshaping of self-image based on feedback from others and self-advocacy. Cognitively, children in this stage have increasing language skills and a grasp of time, and they understand their role and the consequences in relationships. Educators begin to play a greater role in healthy development and might watch for concerns like lack of impulse control, difficulty expressing oneself in full sentences, or poor motor coordination.

Middle Childhood: Ages 6–9

Children in this stage of development constitute the majority of out-of-school time participants. Physical milestones include the gradual replacement of baby teeth with adult teeth, gross motor advancements that lend themselves to contact sports, and advancing fine motor skills that might be expressed through more legible writing or artistic skills. Their social and emotional development could entail establishing special friendships, becoming increasingly responsible, and demonstrating flexible thinking around debates on "right and wrong" or "fair and unfair." Their cognitive development involves greater advancement of executive functioning processes such as working memory, inhibitory control, and cognitive flexibility that shares overlap with social and emotional development (U.S. Department of Education, 2017). Educators and caregivers share evenly in contributing to the healthy development of students in middle childhood. Some warning signs of possible developmental delays include failure to grasp concepts of space, time, or dimension; inappropriate emotional responses or reactions (such as aggression, melancholy, low self-esteem), difficulty concentrating, sitting still or engaging; and either a posture of suspicion or an overly solicitous manner when interacting with adults.

Middle Adolescence: Ages 12–15

Physical milestones during early adolescence include the unmistakable early signs of puberty. Gross and fine motor skills continue to advance. It can be a time of increasing self-esteem, establishment of friend cliques, and increased sibling rivalry in the realm of social and emotional development. Cognitive development includes better planning, organizing, and self-regulation; more nuanced understandings (e.g., of double meanings and metaphors); and use of multiple memory strategies and complex grammatical constructions. Educators and caregivers continue to share in promoting healthy development, though the shift to prioritizing friends' influence over that of caregivers begins in early adolescence. Concerns about possible developmental delay may arise in girls at this stage if there is no clear sign of a growth spurt or at least the beginnings of puberty. Early adolescence can also be a time for safety concerns if a child exhibits very poor judgment and risky behaviors.

Late Adolescence: Ages 15–18

There may still be a wide range of physical development, though nearly all young people reach sexual maturity by the end of late adolescence. In terms of social and emotional development, increasingly emotional bonds are formed outside the home—especially for girls. They may feel conflicted about independence, which can lead to cultural clashes in the home. Other adolescents may be emerging from mood swings and enjoy stronger relationships with their parents at this stage. Cognitive development continues to allow for formal operational thought with abstract, idealistic, logical, hypothetical-deductive reasoning, and complex problem solving and critical thinking (even if critical of peers and adults). The role of non-caregiving adults continues to be important for healthy development. Educators can be watchful for concerns such as a teen's inability to form peer relationships, physical immaturity, grandiosity, emotional disturbances, or lack of empathy.

Source: You for Youth. 2021. "Research Brief: Stages of Child and Adolescent Development."
Retrieved from https://y4yarchives.org/index.php/en/tools/stages-of-child-and-adolescent-development-research-brief

Motivating Adults and Employing Effective Teaching Strategies

As outlined in the Tbilisi Declaration, environmental education is a continuous, lifelong process. While schools are essential to children's learning, these institutions only deliver about 3 to 7 percent of an average person's learning over a lifespan. More than 90 percent of lifelong learning occurs outside of schools and focuses on topics that matter most to people as they seek personally relevant learning opportunities.

The urgent need for environmental solutions, combined with an aging population, makes effective environmental education for adults essential.

Adults as Learners

Historically, adult education has been committed to the practical application of learning, personal transformation, and empowerment of learners to improve the quality of life and communities. Adult education is grounded in an understanding that the nature of the learners, the nature of the context, and the nature of the content interact to define the nature of the learning opportunity.

Some Teaching Ideas Informed by Andragogy[1]
- Involve adults in the planning and evaluation of instruction.
- Experiential learning applies. Experiences, including mistakes, provide the basis for learning.
- Adults are particularly interested in learning about things that have immediate relevance to their personal or work lives.
- Oftentimes, the best adult learning is problem-centered rather than content-oriented.
- Allow for choice and flexibility, as adults tend to be self-directed and in charge of their development and learning processes.
- Acknowledge and build upon adults' rich background of experiences and knowledge.
- Adults generally want to share with peers; create opportunities to do so in various configurations (pairs, large group, small group settings).
- Offer rich, timely, usable feedback coupled with occasions for reflection and active involvement in real-world tasks.

Adults are largely intrinsically motivated: the primary unsatisfied needs they have relate to self-esteem, competence, achievement, self-confidence, and personal growth. ...The primary motivational conditions that occur within a given instructional experience are a climate of respect, attitude (e.g., positivity toward subject; relevancy), deepening meaning and engagement (e.g., sustain interest, enhance learning and decision making), and engendering competence (e.g. demonstrate or gain new knowledge and skills).

Environmental educators have endless opportunities to authentically engage a broad range of adults in environmental education for empowerment, health and well-being, and community improvement.

[1] **Andragogy** is a term that, in referring to adult learners, goes back to the 1920s. The better-known term of **pedagogy** generally focuses on the teaching, instructional methods, and learning for youth.

Excerpted by permission from: McCann, L. & Heimlich, J. 2016. "Aged to Perfection: Environmental Education for Adults" in *Across the Spectrum: Resources for Environmental Educators.* edited by M.C. Monroe & Krasny, M.E. North American Association for Environmental Education, Washington, DC. pp 181-197.
Retrieved from https://dg56ycbvljkqr.cloudfront.net/sites/default/files/eepro-post-files/acrossthespectrum_8-1-16.pdf

Applying Appropriate Scaffolding Strategies: Considerations That Promote and Motivate Learning[2]

Appropriate guidance is a paramount consideration for effectively engaging any learner, whether the learner is at the beginning, intermediate, or advanced level, or any point between. The appropriate guidance, or **scaffolding**, can come in many forms. Scaffolding is an education-related and formal teaching term coined by Jerome Bruner, a 20th-century cognitive psychologist, as he built upon and clarified the work of Lev Vygotsky, a Russian psychologist. Vygotsky developed the notion of "**Zone of Proximal Development**" (ZPD) as a way to characterize a *learner's high probability of learning something* when appropriate guidance is given by a more experienced individual or person.

For those providing guidance, the most direct approach to identifying a learner's ZPD is to frame the learner's immediate learning need based on (a) what the learner can already do or knows and (b) what the learner will not be able to acquire or understand even with any carefully considered information, instruction, or guidance.

For those integrating environmental education in the experiences of children, adolescents, and/or adults, appropriate guidance or scaffolding is critical in promoting successes and positive motivations. Scaffolding uses a combination of one or more of the following four forms of assistance:[3]

- *Physical assistance* is any form of physical help, such as slight nudges to hand-over-hand aid.
- *Modeled* scaffolding refers to modeling any combination of verbal and/or physical demonstration of a concept or skill and then encouraging the learner to demonstrate the same concept or skill.
- *Verbal* guidance or instruction is any form of open-ended verbal cue.
- *Non-verbal* guidance is any contextually and/or culturally relevant facial, finger, or hand cue that prompts the learner to say or do something directly related to the understanding or skill within their ZPD. With non-verbal guidance, it is important that the learner has prior knowledge about the meaning of the gesture or facial look.

On a continuum, physical assistance represents the most intrusive type of guidance. However, physical assistance has a proven record in helping individual learners learn more quickly. It is also effective in instances where physical dexterity or strength is required. Non-verbal cues are the least intrusive, with modeled and verbal guidance falling between physical and non-verbal guidance. The terminal goal of teaching, including environmental education, is to **eventually or gradually remove any guidance** so learners can demonstrate independent understanding and/or skill.

[2] Written by Yash Bhagwanji, Florida Atlantic University

[3] Center for Persons with Disabilities, Utah State University. 1998. Research project supported by the U.S. Department of Education, Grant No. H029K5014B

Resource #10

Developmentally Appropriate Practices

Teaching Young Children: Developmentally Appropriate Practice

It's not too surprising: Young children (birth to age 8) have different learning needs than older children, youth, and adults. Young children are active and inquisitive. They explore everything with all their senses. Their minds and bodies are growing at a phenomenal pace, developing neural connections they will use for the rest of their lives. Learning is everything; experience is everything. Young children are making discoveries and creating connections. They are beginning to understand their individuality and the individuality of others. And they are starting to build relationships between themselves and others and between themselves and the world around them. Providing opportunities for the growth and development of the whole child, opportunities to develop a sense of wonder about nature, and earnest engagement in discovering the real world are the foundation for learning in early childhood.

Developmentally appropriate practice (DAP) is an approach to teaching grounded in the research on how young children develop and learn and what is known about effective early education. Its framework is designed to promote young children's optimal learning and development. DAP involves teachers meeting young children where they are, both as individuals and as part of a group, and helping each child meet challenging and achievable learning goals.

As they make decisions, teachers consider these three areas of knowledge:

- *Knowing about child development and learning*
  Understanding typical development and learning at different ages is a crucial starting point. This knowledge, based on research, helps us predict which experiences will support children's learning and development.
- *Knowing what is individually appropriate*
  What we learn about specific children helps us refine decisions about how to teach and care for each child as an individual. By continually observing children's play and interaction with the physical environment and others, we learn about each child's interests, abilities, and developmental progress
- *Knowing what is culturally important*
  We must make an effort to get to know the children's families and learn about the values, expectations, and factors that shape their lives at home and in their communities. This background information helps us provide meaningful, relevant, and respectful learning experiences for each child and family.

Taken together, all three considerations result in developmentally appropriate practice.

Source: NAEYC. 2009. "Core Considerations of DAP." National Association for the Education of Young Children. 2009. Retrieved from https://www.naeyc.org/resources/position-statements/dap/core-considerations

Environmental Education and Young Children's Developmental Considerations

Early childhood experiences affect the development of internal motivations and later attitudes and dispositions (Committee on the Science of Children Birth to Age 8: Deepening and Broadening the Foundation for Success, 2015). For the development of positive attitudes, dispositions, and internal motivations about nature-based experiences, caregivers and educators can provide formative experiences that encompass the "development of a sense of wonder, appreciation for the beauty and mystery of the natural world, opportunities to experience the joy of closeness to nature, and respect for other creatures" (Simmons, 2016).

Understanding age-related characteristics and how young children learn are primary considerations. Implications for teaching children include establishing or providing appropriate psychological climates, social interactions, indoor and outdoor classroom arrangements, and material manipulation activities that most effectively respond to age groups and learning modes of young children. However, while children in specific age groups may demonstrate similar behaviors, knowledge, and skills, it must also be recognized that developmental variation in individual children can be expected. Individual variations, however, are influenced by epigenetics, meaning that both nature (i.e., genetic influences and heredity predispositions) and nurture (encouragements and experiences received from social-cultural contexts) influence children's growth and development. As a result, teachers and the teaching process must respond appropriately to each child's differing learning needs. In the case of environmental education, awareness of developmentally appropriate practice (DAP) is of paramount importance.

Bhagwanji & Born (2018) delineated the following behaviors and implications for caregiving and teaching in the first five years of children's lives.

For **toddlers**, primary needs include security and exploration. Mobility provides opportunities for exploration and tactile stimulation related to one's immediate surroundings. Exploration in natural settings helps very young children develop sensory awareness and supports the development of a framework of understanding the natural and built environments. Concurrently, they are beginning to develop a sense of self in relation to others, which is made stronger through increased opportunities for interaction with others and exploration of the environment. Rapid growth in motor development brings opportunities to construct knowledge about one's own range of motion, balance, center of gravity, and physical abilities within the context of the natural world. Physical challenges presented by natural elements such as stumps, variations in terrain, and differing textures help the toddler to develop an awareness of the diversity of shapes, sizes, and structures in the natural world, and how these relate to the toddler's being in mind and body. Toddlers love books and stories, and are prone to imitating the "stories" they see acted out in the behaviors of others (Copple & Bredekamp, 2009). They are innately curious about animals and other living things. For this reason, reading and sharing stories about animals and nature will be attractive, and toddlers relish the opportunity to look at pictures of animals, imitate animal noises, and ask questions about animals with a caring adult.

The years between ages 3 and 5 are commonly referred to as "**preschool years**," although many children attend childcare programs (including nature-based) that very much resemble schools. Learning and development of a physical, social, cognitive, and emotional nature happen during this time, and support and participation from a caring adult are crucial in children's development. Chawla (2007) noted that frequently spending "time outdoors with a caring adult," whether in free play or exploration of nature, was a significant factor in the development of many environmentally minded adults. Therefore, time outdoors in natural settings should be a high priority for caregivers and other adults who wish to support children's sense of connection to nature. During this period of development, children are also intensely interested in books, photographs, and other media. Stories are captivating and help children create context and meaning, as well as prompt them to think about their own experiences in nature and other settings. When nature is portrayed in media, adults should be mindful that illustrations, descriptions, and other representations are ethical, accurate, and generally positive (e.g., as opposed to stylized portrayals of animals or depictions of animals as aggressive). In other words, nature should be portrayed as a welcoming, safe place. In many cases, children at this age are able to identify with animal characters more readily than with human characters (Burke & Copenhaver, 2004), and stories featuring animal characters can therefore be particularly comforting, soothing, or arousing.

During this period, children also internalize their culture's collective values and expectations (Thompson, 2006). "Morality" and a sense of fairness are often demonstrated as children experiment with what it means to be "right and wrong" and explore the purpose of rules. This has important implications for environmental education when one considers that adults who act on behalf of the environment often do so as a result of their values, their own morality, and their sense of right and wrong. Modeling pro-environmental behavior has a powerful effect on children in the preschool years.

Teaching and Learning Through Play—Strategies that Support Positive Internal Motivations

Play is a central consideration and an important influence when teaching young children. When children engage in play, a variable number of physical and psychological interactions occur to advance children's knowledge, development of skills, and development of dispositions. Play is an important mechanism—be it through pretend or symbolic play, discovery learning, constructive play, or socio-dramatic play—tied to practice and internal motivations that assist the child in achieving greater abilities and maturity over time. Children are actively engaged in learning processes during playful and enjoyable activities. Incorporating opportunities to learn through enjoyable experiences and play is an essential method of teaching. Play in nature is of particular value in relation to environmental education, since nature-based play helps to develop children's attention to qualities and conditions in their local communities (both built and natural) as well as helping to strengthen their social connection and development in relation to others, which suggests that children are inclined to take positive action by virtue of the time spent in nature. Unstructured, child-directed nature play affirms children's sense of nature as intrinsically valuable and meaningful (Kellert & Wilson, 1993), which may later evolve into a deeper connection with the natural world.

Other Important Teaching Opportunities

Other teaching opportunities include supporting children's development of problem-solving skills along with the development of interest and appreciation in the world around us (Simmons, 2016). In early childhood, learning "is more than a cognitive process and emotions play a particularly important role" (Simmons, 2016; Harlan and Rivkin, 2008). Early childhood educators should provide opportunities for children to "experience peace, joy, and fascination with nature because these emotions undergird their developing knowledge, skills, and dispositions" (Simmons, 2016; Gardner, 1999).

References:

Bhagwanji, Y, & Born, P. 2018. "Use of Children's Literature to Support an Emerging Curriculum Model of Education for Sustainable Development for Young Learners." *Journal of Education for Sustainable Development.* 12(2), 85-102.

Burke, C. L., & Copenhaver, J. G. 2004. "Animals as People in Children's Lliterature." *Language Arts*. 81(3), 205–213.

Chawla, L. 2007. "Childhood Experiences Associated with Care for the Natural World." *Children, Youth and Environments*.17(4), 144–170.

Committee on the Science of Children. 2015. "Birth to Age 8: Deepening and Broadening the Foundation for Success." *Transforming the Workforce for Children Birth Through Age 8: A Unifying Foundation.* National Academies of Sciences, Engineering, and Medicine. Washington, DC: The National Academies Press.

Copple, C., & Bredekamp, S. 2009. *Developmentally Appropriate Practice in Early Childhood Programs Serving Children from Birth through Age 8* (3rd ed.). Washington, DC: National Association for the Education of Young Children.

Gardner, H. 1999. *Intelligence Reframed: Multiple Intelligences for the Twenty-First Century.* New York: Basic Books.

Harlan, J., & Rivkin, M. 2007. *Science Experiences for the Early Childhood Years: An Integrated Affective Approach*. Englewood Cliffs, NJ: Prentice Hall.

Kellert, S. R., & Wilson, E. O. (Eds). 1993. *The Biophilia Hypothesis*. Washington, DC: Island Press. 1993.

Simmons, B. et al. 2016. *Early Childhood Environmental Education Programs: Guidelines for Excellence.* Washington, DC: NAAEE. Retrieved from https://eepro.naaee.org/sites/default/files/eepro-post-files/early_childhood_ee_guidelines.pdf

Thompson, R. 2006. *The Development of the Person: Social Understanding, Relationships, Conscience, Self.* Medford, MA: John Wiley & Sons.

If you want to learn more about early childhood environmental education, here are some resources worth exploring:

• Ardoin, N. and A. Bowers. 2020. "Early Childhood Environmental Education: A Systematic Review of the Research Literature." *Educational Research Review* 31. Retrieved from https://www.sciencedirect.com/science/article/pii/S1747938X19305561
• Natural Start Alliance, https://naturalstart.org/
• NAAEE. *International Journal of Early Childhood Environmental Education*. Retrieved from https://naturalstart.org/research

Resource #11

Environmental Education Materials: Guidelines For Excellence

Environmental Education Materials: Guidelines for Excellence, published by NAAEE, describes a set of recommendations for developing and selecting environmental education instructional resources. These guidelines aim to help producers of activity guides, lesson plans, and other instructional materials create high-quality products and to provide educators with a tool to evaluate the wide array of available environmental education materials.

Environmental Education Materials: Guidelines for Excellence points out six key characteristics of high-quality environmental education instructional materials:

#1 Accurate
Environmental education instructional materials are accurate and comprehensive in describing environmental conditions, concepts, attitudes, processes, challenges, and decisions, and in reflecting the diversity of perspectives on them.

#2 Emphasis on Skills Building
Environmental education instructional materials build lifelong skills that enable all learners to arrive at their own conclusions and make reasoned decisions about environmental challenges and opportunities.

#3 Depth of Understanding
Environmental education instructional materials aim to foster the development of the personal awareness and deep conceptual understandings necessary for environmental literacy.

#4 Personal and Civic Responsibility
Environmental education instructional materials promote personal and civic responsibility, encouraging learners to use their knowledge, skills, and assessments of environmental, social, political, cultural, and economic systems as a basis for environmental decision-making and action.

#5 Instructional Effectiveness
Environmental education materials rely on instructional principles and techniques that create effective and responsive learning environments for all learners.

#6 Usability
Environmental education materials are well-designed and easy to use.

Source: Simmons, B., et al. 2021. *Environmental Education Materials: Guidelines for Excellence*. North American Association for Environmental Education. Retrieved from: https://eepro. naaee.org/resource/guidelines-excellence-series

Resource #12

Enhancing Broad Participation in Environmental Education Programs

Laws such as the Americans with Disabilities Act (ADA) and the Individuals with Disabilities Education Act (IDEA) require ease of access for all individuals. Environmental educators can use the principles outlined in these acts to make their programs available to people who might otherwise have difficulty participating.

Legal Requirements: A Comparison of ADA, IDEA, and Section 504

Three laws are of particular importance—the Americans with Disabilities Act (ADA), Section 504 of the Rehabilitation Act of 1973, and the Individuals with Disabilities Education Act (IDEA). The following descriptions, from the U.S. Department of Justice, provide a legal overview:

Americans with Disabilities Act (ADA)
The ADA prohibits discrimination on the basis of disability in employment, state and local government, public accommodations, commercial facilities, transportation, and telecommunications. It also applies to the United States Congress.

To be protected by the ADA, one must have a disability or have a relationship or association with an individual with a disability. An individual with a disability is defined by the ADA as a person who has a physical or mental impairment that substantially limits one or more major life activities, a person who has a history or record of such an impairment, or a person who is perceived by others as having such an impairment. The ADA does not specifically name all of the impairments that are covered.

Individuals with Disabilities Education Act (IDEA)
The Individuals with Disabilities Education Act (IDEA) (formerly called P.L. 94-142 or the Education for All Handicapped Children Act of 1975) requires public schools to make available to all eligible children with disabilities a free, appropriate public education in the least restrictive environment appropriate to their individual needs.

IDEA requires public school systems to develop appropriate Individualized Education Programs (IEP's) for each child. The specific special education and related services outlined in each IEP reflect the individualized needs of each student.

IDEA also mandates that particular procedures be followed in the development of the IEP. Each student's IEP must be developed by a team of knowledgeable persons and must be reviewed at least annually. The team includes the child's teacher; the parents, subject to certain limited exceptions; the child, if determined appropriate; an agency representative who is qualified to provide or supervise the provision of special education; and other individuals at the parents' or agency's discretion.

Section 504 of the Rehabilitation Act of 1973 (Section 504)
The Rehabilitation Act prohibits discrimination on the basis of disability in programs conducted by federal agencies, in programs receiving federal financial assistance, in federal employment, and in the employment practices of federal contractors. The standards for determining employment discrimination under the Rehabilitation Act are the same as those used in Title I of the Americans with Disabilities Act.

Section 504 states that "no qualified individual with a disability in the United States shall be excluded from, denied the benefits of, or be subjected to discrimination under" any program or activity that either receives federal financial assistance or is conducted by any executive agency or the United States Postal Service.

Source: U.S. Department of Justice. 2020. "A Guide to Disability Rights Laws."
Retrieved from https://www.ada.gov/cguide.htm#anchor65310

What Does This Mean For Your Effort?

The American Bar Association (2015) has produced a series of checklists to help in organizing meetings, including considerations of:

- Exterior building features (e.g., barrier-free entrances, easy-to-open doors, crosswalks with audible and visual signals)
- Interior building features (e.g., Braille and tactile signage at elevators and exits, wheelchair accessible doorways)
- Meeting room features (e.g., visible space for interpreters to stand, display tables accessible by those in wheelchairs or on scooters, toileting space and water for service animals)
- Registration materials (e.g., request for accommodations included, ADA compliant website, staff member or volunteer identified to assist those with disabilities)
- Presentations (e.g., avoid strobe lights, face the audience, visually describe slides and other presentation materials)
- Meeting materials (e.g., prepare meeting handouts to accommodate individuals with visual impairments)

Source: American Bar Association. 2015. "Accessible Meetings and Events: Tool Kit." Retrieved from https://www.americanbar.org/content/dam/aba/administrative/commission-disability-rights/accessible-meetings-toolkit.pdf

Selected Resources:

- American Bar Association. n.d. "Making Meetings and Events Accessible for Persons Who are Neurodiverse." Retrieved from bit.ly/41FFZVy
- United States Access Board. 2014. "Outdoor Developed Areas: A Summary of Standards for Federal Outdoor Developed Areas." Retrieved from https://www.access-board.gov/files/aba/guides/outdoor-guide.pdf
- U.S. Department of Justice. 2010. "ADA Standards for Accessible Design." Retrieved from https://www.ada.gov/law-and-regs/design-standards/

Resource #13

Environmental Education Programs: Guidelines For Excellence

Environmental Education Programs: Guidelines for Excellence, published by NAAEE, comprises a set of recommendations for developing and implementing high quality environmental education programs. These recommendations provide a tool that can be used to ensure a firm foundation for new programs or to demonstrate program value and inform improvements. The overall goal of these guidelines is to facilitate a superior educational process leading to sustainability.

Guidelines for Excellence
Environmental Education Programs

Environmental Education Programs: Guidelines for Excellence points out six key characteristics of high-quality environmental education programs:

Prepare

Key Characteristic #1 Gather Information and Assess Priorities and Resources

Conduct a self-assessment, including how the program supports the organization's vision, mission, and strategic priorities; addresses environmental, educational, and community needs; creates relevant and responsive learning environments; and satisfies marketplace demands. Use existing program evaluation results and, as appropriate, conduct further program assessments in cooperation with stakeholders and other community partners.
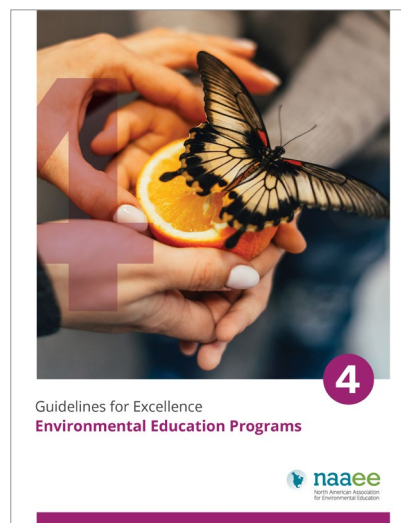
Plan

Key Characteristic #2 Design Instruction

Design instructional content and strategies with well-articulated goals and objectives that lead to environmental literacy, meet the needs of audience members, and address community concerns and aspirations. Build the program on a foundation of quality instructional materials and well-prepared staff. Purposefully co-design instruction in collaboration with stakeholders and other community partners.

Key Characteristic #3 Design Program Structure and Delivery

Develop a program format and delivery system that supports instructional goals and objectives and meets audience needs. Build program planning on a foundation of thorough preparation, including budget planning, facilities management, and concern for health and safety. Create a supportive, safe, relevant, responsive, and welcoming learning environment. Coordinate instructional delivery in collaboration with stakeholders and other community partners.

Key Characteristic #4 Develop an Evaluation Plan

Develop an evaluation plan, including guiding questions for each phase of the program development cycle. Design data collection methods, documenting relevant program inputs, outputs, outcomes, and impacts. Build in ways to monitor and use evaluation results throughout program implementation.

Implement

Key Characteristic #5 Deliver Program and Implement Evaluation Plan

Deliver educational experiences that meet stated goals and objectives, including the development of environmental literacy. Provide a supportive, safe, relevant, responsive, and welcoming learning environment. Implement the evaluation plan.

Learn, Adjust, Celebrate

Key Characteristic #6 Analyze, Adapt, And Share

Take time to document, analyze, learn, and reflect. Examine evaluation results and consider what they mean in terms of how the program can be improved and whether it should be continued. If the program is ongoing, adjust it as necessary, and plan for its long-term sustainability. Celebrate successes, including partnerships, and share the results so others can learn from program efforts.

Source: Simmons, B. et. al. 2022. *Environmental Education Programs: Guidelines for Excellence.* North American Association for Environmental Education. Retrieved from https://eepro.naaee.org/resource/guidelines-excellence-series

Resource #14

Civic Engagement

According to Thomas Ehrlich, civic engagement involves "working to make a difference in the civic life of one's community and developing the combination of knowledge, skills, values, and motivation to make that difference. It means promoting the quality of life in a community, through both political and non-political processes."[1]

Whether working individually or in groups, civic engagement can take many forms— volunteering on a habitat restoration project on public property, writing a letter to the editor about local air quality, or organizing a study circle to deliberate community responses to a local environmental concern. Civic engagement, especially engagement designed to improve community well-being, environmental sustainability, and resilience, requires individuals who are willing and able to act on their conclusions derived from shared visions and goals.

Facilitating the development of civic engagement capacities can be complex. Research suggests that there are four interrelated constructs necessary for civic engagement:[2]

- *Civic Action, or participation in activities such as volunteering or service-learning, to help better the community*
- *Civic Skills, or the ability to be involved in civic society, politics, and democracy*
- *Social Cohesion, a sense of reciprocity, trust, and bonding to others*

Engaging in civic engagement results in both community-level and individual-level outcomes. A synthesis of research literature, focusing on environmental education and civic engagement, identified six civic engagement outcomes:[3]

At the Community Level
- Social Cohesion
- Community Well-Being

At the Individual Level
- Civic Knowledge and Understanding
- Civic Attitudes and Dispositions
- Civic Skills
- Civic Action

Civic engagement is vital to democracy because it supports governance and political institutions. Communities with engaged members tend to be more resilient, more equitable, and more economically sound because of the heightened levels of social capital produced by people working together to improve their community.

[1] Ehrlich, T. 2000. *Civic Responsibility and Higher Education*. Lanham, MD; Rowman & Littlefield.
[2] Youth.gov. n.d. "Civic Engagement." Retrieved from https://youth.gov/youth-topics/civic-engagement-and-volunteering
[3] eeWorks. n.d. "Civic Engagement and Environmental Education." Retrieved from https://naaee.org/sites/default/files/2024-06/eeWORKS-Civic%20Engage-Exec-Sum-NA.pdf

Instructional Strategies That Support Civic Engagement

Educators can provide important opportunities for learners to gain necessary civic engagement skills and valuable experiences in public governance. The following are a few of the instructional resources available to educators interested in facilitating civic engagement opportunities for their learners.

Community Action Projects for the Environment (CAPE) is a 4-H program for youth 11 to 18 years old. It guides youth clubs through exploring local environmental concerns, establishing partnerships with interest groups, and making a request of a decision-maker that will benefit the community. CAPE's program model is online, readily available to youth clubs beyond 4-H.

The CAPE program is designed to address these objectives:
- Youth will be able to engage in community governance and local civic processes at an appropriate scale for their selected issue, with the support of stakeholders and partners.
- Youth will gain self-efficacy and collective efficacy as they work with their club and partners to address an environmental issue in their community.

To learn more about CAPE, visit https://programs.ifas.ufl.edu/cape/

Community Voices, Informed Choices (CIVIC) is an Extension initiative designed to help communities address complex issues. The program is co-led by faculty at Florida A&M University and the University of Florida. Through deliberative discussions and town hall meetings, CIVIC activities provide science-based information and engage community members in deliberative discussions of contentious issues that require community-scale solutions. Participants gain knowledge of the issue, hear different perspectives, and identify actions that lead to community solutions.

A successful CIVIC activity is not a debate or arm-wrestling competition. It is a thoughtful expression of options and trade-offs that address an issue and explore why people think some choices might be better than others. This healthy two-way conversation involves understanding the conditions and assumptions that lead people to prioritize different solutions. It helps a community focus on a path forward to address complex issues and invites participants to continue the momentum toward change. It helps people examine the motivating question, "What should we do?" while generating the energy to begin the next step.

For more information about CIVIC, visit https://programs.ifas.ufl.edu/civic/

Earth Force uses a research-based model to implement environmental action civics. Through the six-step process, students identify environmental problems, determine the policies and practices at the root of the problem, and implement solutions using civic means. The process prioritizes youth voice, youth-adult partnerships, shared decision-making, and civic action. Through Earth Force and its network of partners, young people get real-world opportunities to practice civic skills, acquire a deep understanding of the environment, and develop the skills and motivation to become lifelong leaders in addressing community issues.

To learn more about Earth Force, visit www.earthforce.org

National Wildlife Federation's Eco-Schools USA combines environment-based education with hands-on experiences and sparks action in classrooms and schools that ripples out into the greater community. Using a seven-step framework, students from pre-kindergarten through 12th grade engage in making their community and world a more equitable and sustainable place to live.

Through student-led Eco-Action Teams, students develop strong leadership skills, think creatively and critically about sustainability challenges, and develop and implement place-based solutions. Embracing student voice ensures instruction is based on what students care about—their passions. It offers ways for learners to influence others and make choices about the learning process by expressing themselves and communicating with their peers and members of the community.

For more information, visit: https://www.nwf.org/Eco-Schools-USA/Framework

NOAA Meaningful Watershed Educational Experiences (MWEEs) is a learner-centered framework that focuses on investigations into local environmental issues and leads to informed action. MWEEs include learning both outdoors and in the classroom and are designed to engage students in building knowledge and meaning through active learning experiences. In these experiences, the core ideas and practices of multiple disciplines are applied to make sense of the relationships between the natural world and society. MWEEs help connect students with their local environment and equip them to make decisions and take actions that contribute to stronger, sustainable, and equitable communities.

Throughout the MWEE, teachers provide structure, support, and encouragement as students use their curiosity and creativity to investigate and take action to address a local environmental issue. MWEEs are appropriate for all grade levels. Tith content and practices growing in complexity and sophistication across the grades—starting with teacher-guided investigations and progressing to student-led inquiry. Using the MWEE framework helps educators create an engaging program to achieve their learning objectives (i.e., the knowledge, skills, and attitudes that students should be able to exhibit following instruction).

For more information, visit https://www.noaa.gov/education/explainers/noaa-meaningful-watershed-educational-experience

Jane Goodall's Roots & Shoots program encourages, supports, and amplifies young people (and the young at heart!) taking action in their own communities and beyond. Roots & Shoots provides participants with resources, tools, funding, and connections to a global family as they undertake projects that benefit the environment and improve the lives of people and animals. Roots & Shoots projects are youth-led and based on the idea that everyone has the opportunity to choose the kind of impact they make every day. There are active Roots & Shoots programs in 75 countries around the world and over 1.2 million people are involved.

To learn more or join Roots & Shoots, go to rootsandshoots.global and rootsandshoots.org.

Resource #15

Positive Learning Environment Observation Checklist

Using a checklist or other self-assessment can help you and your staff gauge whether you are creating the desired learning environment. The following, adapted from You for Youth, provides an example of an observational checklist:

This checklist includes indicators of a positive learning environment across six program components: safety, interpersonal relationships, teaching and learning, learner engagement, staff interactions, and family and community engagement. The checklist can then be used as an observation tool to help identify challenges and areas of strength, reflect on findings, and set priorities as you seek to create a safe, supportive, welcoming space.

Safety

- Security procedures are implemented (e.g., securing entrances and exits, identifying visitors, taking attendance, and monitoring participant movement).
- Program areas meet internal participant-to-adult ratio goals.
- Expectations for participant behavior and social interactions are clearly communicated both orally and visually, where all participants can see them (e.g., posted anchor charts, rules, or site guidelines).
- The environment appears safe and comfortable, with appropriate noise levels in each area.
- Students are safe from verbal abuse and bullying from others.
- There are no visible safety hazards (e.g., unsecured rugs, cords, or other tripping hazards, broken outlets).

Interpersonal Relationships

- Mutual respect is demonstrated.
- A staff member personally greets each participant at the door each day.
- Interactions among and between participants and others appear to be positive.
- Site staff have high expectations for participants' success, seem willing to listen to participants and get to know them as individuals, and exhibit concern for participants' challenges.
- Participant-to-participant relationships demonstrate friendships, teamwork, and positive one-on-one interactions.

Teaching and Learning

- The program area is clean, organized, and has adequate resources and materials.
- Program activities support participant character building and development skills (e.g., effective listening, conflict resolution, self-reflection, emotional regulation, empathy, personal responsibility, ethical decision-making).
- Activities reflect alignment with the academic, social, emotional, and physical needs of participants.
- Activities include enrichment experiences to help support program goals.
- Program staff regularly conduct assessments to ensure that necessary elements are in place to run the program effectively (e.g., barriers to effectiveness identified, staff training or curriculum in place, necessary tools and equipment present and in working condition).
- Program facilitators invite participants to explore and share problem-solving strategies (e.g., posing challenges that interest participants, asking probing questions, demonstrating enthusiasm for active participation, and affirming participant effort).
- Program facilitators help participants make connections between program activities and their prior knowledge.
- Program staff use teaching practices that include at least some of the following: encouragement and constructive feedback, opportunities to demonstrate knowledge and skills, independent thinking, inquiry, and dialogue.

Participant Engagement
- The program creates opportunities to acknowledge participant achievements, contributions, and responsibilities (e.g., group presentations, reflections, exhibitions, performances, celebrations).
- Participants receive individual rewards, positive feedback, or verbal recognition for good behavior and/or successes.
- Participants have formal and informal opportunities to identify and express their emotions; as needed, they have opportunities to step away and process emotions before they re-engage.
- Participants consistently have opportunities to explain their perspectives.
- Participants have appropriate voice and choice in selecting and participating in activities.
- Participants regularly have opportunities to voice their concerns and to provide input on program improvement efforts.

Staff Interactions
- Staff members model positive interactions and respectful behavior with each other and with participants.
- Efforts to improve the program climate are discussed during regularly scheduled staff meetings and implemented as agreed.
- Staff members help to identify professional learning needs around creating a positive learning environment and attend professional learning events.
- Program leaders offer staff professional learning opportunities relevant to their duties.
- Staff members actively engage with youth and attempt to nurture a strong sense of community in the program.

Family and Community Engagement
- Program documentation and/or observation indicates that families and community members demonstrate they identify with the program (e.g., by using terms like "us" and "we" when referring to the program, by showing pride in being part of the program).
- Program documentation and/or observation indicates that families and community members show support for the program (e.g., by attending program events, sharing program information within the local community, participating in group activities, providing suggestions to program staff, leading program activities).
- Program documentation and/or observation indicates that families, community members, and other stakeholders are invited to attend meetings to discuss partnership collaborations and program improvements.

Source: You for Youth. 2019. "Positive Learning Environment Observation Checklist."
Retrieved from https://y4yarchives.org/index.php/en/tools/positive-learning-environment-observation-checklist

Resource #16

Connecting Program Design, Evaluation, and Improvement

Program evaluation is the systematic collection of information about the activities, characteristics, and outcomes of programs to make judgments about the program, improve program effectiveness and/or inform decisions about future programming.[1]

Program design and evaluation are interconnected and crucial for developing effective programs. Strong program design, including clearly defined goals, activities, and resources, provides the foundation for a successful evaluation. Evaluation, in turn, informs and improves program design by providing insights into program effectiveness, areas for improvement, and the overall impact on participants. A well-designed evaluation sets the stage for continuous program improvement.

One way of building evaluation into the program design process is to use a logic model. Logic models provide a roadmap, describing where you want to go, how you will get there, and how you will know when you have arrived. They are designed to guide program planning and implementation by clarifying the relationships among key program elements:

Inputs: Resources needed to accomplish a set of activities
Outputs: Activities designed to achieve the program goal
Participants: Who will participate in project activities
Outcomes: Intended accomplishments of the project, often including short-term (immediate), medium-term (2–3 years), and long-term (4–10 years) outcomes.

Logic models also guide program evaluation by identifying evaluation questions and indicators that correspond to each of the identified inputs, outputs, participants, and outcomes.

[1] Patton, M. Q. (2008). *Utilization-Focused Evaluation* (4th ed.). Sage Publications.

Simple Logic Model, Evaluation Questions, and Indicators

Name of Program/Project:

Description of the Situation:

Priorities:

Inputs	Outputs	Participants	Outcomes		
			Short Term	Mid-term	Long Term
• Staff • Money • Time • Materials • Partners	• Workshops • Publications • Services • Events • Products	• Teachers • Youth • Community members	• Increased knowledge and increased skills	• Increased knowledge and increased skills used in appropriate settings	• Goal is reached and sustained

Outcomes: What do you want to know?

• Were all the inputs sufficient and timely? • Did they meet the program goals?	• Did all the activites occur as intended? • What was the quality of the intervention? • Was the content appropriate?	• DId the target community members participate? • Who did not participate? • Who else was reached?	• Did knowledge increase? • What else happened?	• Are community members continuing to participate in the program activities? • Are they participating in other activities?	• To what extent has environmental quality increased?

Outputs: How will you know it?

• # staff • $ invested • Delivery timetable	• # workshops scheduled • Publications printed • # events	• Actual vs. desired attendance • % that attended per workshop	• #, % with increased knowledge	• #, % using new knowledge and skills to monitor progress	• # of species recovered • Other positive environmental benefits

Resource #17

Practitioner Guide to Assessing Connection to Nature

The *Practitioner Guide to Assessing Connection to Nature* provides environmental educators and others with a bank of vetted tools for measuring connections to nature. The guide provides background information and a decision tree to help practitioners choose an appropriate tool or approach given their needs, the length of their programs, and their audiences.

The authors reviewed a range of tools for measuring connections to nature and selected eleven that had already appeared in the literature and been tested for reliability and validity. The authors chose easy-to-use tools that produce data that can be analyzed with commonly available software.

Each of the eleven tools includes essential background information describing what it measures, its format (e.g., interview, survey, journaling, drawing), how it has been used, and useful tips for employing the tool. In addition to providing a copy of the tool itself, the authors include suggestions for recording and analyzing data.

Source: Salazar, G., K. Kunkle, and M.C. Monroe. 2020. *Practitioner Guide to Assessing Connection to Nature.* Washington, DC: North American Association for Environmental Education.
Retrieved from https://naaee.org/sites/default/files/2022-10/Assessing%20Connection%20to%20Nature.5.6.20.pdf

North American Association
for Environmental Education

Education We Need for the World We Want

NAAEE uses the power of education to advance environmental literacy and civic engagement to create a healthier and more sustainable future! We work with educators, policymakers, and partners throughout the world.

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