Guidelines for Excellence
K–12 Environmental Education

Executive Summary

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For more than five decades, NAAEE has been the leader in promoting excellence in environmental education throughout North America. NAAEE is the only national professional organization dedicated to strengthening environmental education and increasing the visibility and effectiveness of the field. With members and supporters in more than 60 countries, over 20,000 members and affiliations, including 54 state, regional, and provincial environmental education organizations, NAAEE's influence stretches across North America and around the world.

NAAEE supports the field with a variety of 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 national gathering of environmental education professionals in North America and promotes innovation in the field, networking, new tools and resources, and dissemination of research and best practices.

Resources and eePRO—Through its website and eePRO, our online professional development hub, NAAEE provides its members and supporters with high-quality professional resources 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 non-partisan organization that plays a leadership role in raising the profile of environmental education at an international level. 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 and broadening the reach and impact of environmental education.

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Introduction

The *Executive Summary* serves as an easy reference to *K-12 Environmental Education: Guidelines for Excellence* (NAAEE 2019), providing students, parents, caregivers, educators and others a roadmap to achieving environmental literacy by setting expectations for fourth (age 10), eighth (age 14) and twelfth grade (age 18) students. It outlines a framework for effective and comprehensive environmental education programs and curricula. These guidelines define the aims of environmental education. They set a standard for high quality education, based on what an environmentally literate person should know and be able to do by the time they graduate from high school. They draw on the best thinking in the field to outline the core ingredients of environmental education.

The Framework: How the *Guidelines* are Organized

As in the full document, the *Executive Summary* is organized into four strands, each of which is further delineated by a set of guidelines that describe a level of skill or knowledge appropriate for each of the three grade levels. In the Executive Summary, guidelines for a particular strand are arranged so that the user can quickly understand the flow of guidelines at a grade level or compare how guidelines progress across the grade levels. It should be remembered that the Executive Summary is designed to provide only an overview. For a more in-depth view of the strands and their guidelines, it will be necessary to refer to *K-12 Environmental Education: Guidelines for Excellence* (NAAEE 2019).

STRAND 1

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

> **A. Questioning**
> **B. Designing investigations**
> **C. Collecting information**
> **D. Evaluating accuracy and reliability**
> **E. Organizing and analyzing information**
> **F. Working with models and simulations**
> **G. Drawing conclusions and developing explanations**

STRAND ②
Environmental Processes and Systems
Environmental literacy is dependent on an understanding of 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) results 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 in three sub-categories:

2.1—Earth's physical and living systems
    A. Earth's physical systems
    B. Earth's living systems

2.2—Human systems
    A. Individuals, groups, and societies
    B. Culture
    C. Political systems
    D. Economic systems

2.3—Environment and society
    A. Human-environment interactions
    B. Resource distribution and consumption
    C. Places
    D. Change and conflict

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 the abilities to define, learn about, evaluate, and act 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 own actions and actions taken by other individuals and groups, including environmental, social, and economic implications for long-term sustainability. In this section, the guidelines are grouped in two sub-categories:

3.1—Skills for analyzing and investigating environmental issues
    A. Identifying and investigating issues
    B. Sorting out the consequences of issues
    C. Identifying and critiquing alternative solutions and courses of action
    D. Working with flexibility, creativity, and openness

3.2—Decision-making and action skills
    A. Forming and evaluating personal views
    B. Evaluating the need for action
    C. Planning and taking action
    D. Evaluating the results of actions

STRAND **4**

Personal and Civic Responsibility

Environmentally literate community members are willing and able to act on their own conclusions about what should be done to ensure environmental quality, social equity, and economic prosperity. As learners develop and apply concept-based learning and skills for inquiry, analysis, and action, they also understand that what they do individually and in groups can make a difference.

> **A. Recognizing rights and responsibilities**
> **B. Recognizing efficacy and developing agency**
> **C. Accepting personal responsibility**

Taken together, this framework creates a vision of environmental literacy. The sequence of the strands—and the individual guidelines themselves—may suggest that some skills or knowledge serve as a foundation for others. But the process of becoming environmentally literate is not linear, and the sequence of the guidelines is more a function of bringing an order and logic to this document than establishing a hierarchy of skills and knowledge.

STRAND ●1
Questioning Analysis and Interpretation Skills

GRADES K-4	GRADES 5-8	GRADES 9-12
A. Questioning—Learners develop questions that help them conduct simple investigations and learn about the environment.	**A. Questioning**—Learners develop, refine, and explain questions that help them conduct environmental investigations and learn about the environment.	**A. Questioning**—Learners develop, modify, clarify, and explain questions that guide environmental investigations of various types. They describe criteria that influence the questions they pose and explain their reasoning.
B. Designing investigations—Learners design simple environmental investigations.	**B. Designing investigations**—Learners design environmental investigations to answer specific questions – often their own questions.	**B. Designing investigations**—Learners design investigations to explore environmental questions, problems, issues, phenomena, and models. They explain their reasoning.
C. Collecting information—Learners locate and collect information about the environment and environmental topics.	**C. Collecting information**—Learners locate and collect quantitative and qualitative information about the environment and environmental topics, using a range of methods and sources. They explain why they used selected information collection methods.	**C. Collecting information**—Learners use established protocols to locate and collect information for environmental investigations of many types. They use increasingly sophisticated methods and technology to access, gather, store, and display the information they collect.
D. Evaluating accuracy and reliability—Learners identify basic criteria to judge the merits of information and information sources.	**D. Evaluating accuracy and reliability**—Learners compare the weaknesses and strengths of the information and the information sources they are using in their environmental inquiries.	**D. Evaluating accuracy and reliability**—Learners apply logic and reasoning skills to evaluate the completeness and reliability of a range of environmental information and information sources.
E. Organizing and analyzing information—Learners describe data and organize information to search for relationships and patterns concerning the environment and environmental topics.	**E. Organizing and analyzing information**—Learners classify, organize, and display data and information they collect in ways that help them analyze and interpret their environmental investigations.	**E. Organizing and analyzing information**—Learners organize, analyze, and display data and information from their environmental investigations for a variety of audiences and purposes.
F. Working with models and simulations—Learners use models to represent environmental relationships, patterns, and processes.	**F. Working with models and simulations**—Learners use models to analyze information that support their environmental investigations. They explain the purposes and limitations of these models.	**F. Working with models and simulations**—Learners create, use, test, and evaluate models to analyze environmental questions, problems, issues, or phenomena.
G. Drawing conclusions and developing explanations—Learners develop explanations that address their questions about the environment.	**G. Drawing conclusions and developing explanations**—Learners synthesize their environmental observations and findings into coherent explanations.	**G. Drawing conclusions and developing explanations**—Learners propose explanations that address their initial environmental questions using quantitative and qualitative data and evidence that has been collected and analyzed.

STRAND **2**

Environmental Processes and Systems
2.1 Earth's physical and living systems

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<td>GRADES K-4</td>
<td>GRADES 5-8</td>
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A. Earth's physical systems—Learners describe characteristics of Earth's physical systems, including air, water, and land. They explain how these systems interact with one another and identify changes in the physical environment over time. They provide examples of how physical systems affect living organisms, including humans.

B. Earth's living systems—Learners identify basic similarities and differences among a wide variety of living organisms. They explain ways that living organisms, including humans, affect the environment in which they live, and how their environment affects them.

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A. Earth's physical systems—Learners describe the physical processes that shape Earth, including weather, climate, plate tectonics, and the hydrologic cycle. They explain how matter cycles and energy flows among the abiotic and biotic components of the environment. They describe how humans affect and are affected by Earth's physical systems.

B. Earth's living systems—Learners describe how living things, including humans, are dependent on their environment and are adapted to live in particular ecosystems under particular environmental conditions. They describe major interactions among organisms and populations of organisms and explain the importance of biodiversity to ecosystem health. They describe how humans affect and are affected by the biosphere.

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A. Earth's physical systems—Learners describe the major processes and systems that form Earth and relate these processes, especially those that are large-scale and long-term to characteristics of Earth. They explain how changes in one system (hydrosphere, atmosphere, geosphere, and biosphere) result in changes to another. They describe how human sustainability depends on Earth systems.

B. Earth's living systems—Learners describe basic population dynamics, genetic mechanisms behind biological evolution, and the importance of diversity in living systems. They explain how changes in the hydrosphere, atmosphere, and geosphere affect the biosphere. They describe how human sustainability is dependent on the biosphere.

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STRAND ❷
Environmental Processes and Systems
2.2 Human Systems

GRADES K-4	GRADES 5-8	GRADES 9-12
A. Individuals, groups, and societies—Learners generate examples of how people act, as individuals, as members of a group, and as members of society, toward the environment. They articulate their own beliefs and the beliefs of family and community members about the environment and environmental issues.	**A. Individuals, groups, and societies**—Learners explain ways that individual traits and group membership or affiliation influence perceptions of and actions toward the environment. They describe how their environmental beliefs and values are shaped by their community and the larger society. They compare their beliefs and values to those held by others in their community.	**A. Individuals, groups, and societies**—Learners observe and describe ways that individual and group action affects the environment, and how each can work to promote the common good. They analyze differing beliefs and values within the same community and the larger society and explain how sustainable solutions rely on reconciling diverse perspectives.
B. Culture—Learners identify ways that people express different cultural backgrounds and how these can influence environmental perceptions and activities.	**B. Culture**—Learners describe examples of the interconnection between cultural perspectives and the environment.	**B. Culture**—Learners recognize and describe examples of different cultural perspectives and dynamics and apply their understanding to current and historical environmental situations.
C. Political systems—Learners identify characteristics of political systems and how they help people by providing basic services, maintaining order, managing conflict and caring for the environment.	**C. Political systems**—Learners describe how political systems at varying scales account for, manage, and affect natural resources and environmental quality.	**C. Political systems**—Learners analyze how political systems and political decision-making, from the local to international levels, impact environmental quality and long-term sustainability.
D. Economic systems—Learners identify basic characteristics of economic systems that help people make choices about how to use resources, including natural resources, to satisfy human needs and wants.	**D. Economic systems**—Learners describe how economic systems and economic decision-making influence natural resource use and management as well as environmental and human well-being.	**D. Economic systems**—Learners analyze how economic systems and economic decision-making affect environmental quality and long-term sustainability at local, tribal, national, and global levels.

STRAND ❷
Environmental Processes and Systems
2.3 Environment and Society

GRADES K-4	GRADES 5-8	GRADES 9-12
A. Human-environment interactions—Learners identify ways that people depend on, change, and are affected by the environment.	**A. Human-environment interactions**—Learners describe human-caused changes that affect the immediate environment as well as other places, other people, and future times.	**A. Human-environment interactions**—Learners analyze ways that humans interact with their environment and how these interactions change with technological developments. Learners determine costs and benefits to different groups in society as well as unintended consequences.
B. Resource distribution and consumption—Learners describe ways people harvest, re-distribute, and use natural resources.	**B. Resource distribution and consumption**—Learners explain that uneven geographic distribution of natural resources influences their use and perceived value.	**B. Resource distribution and consumption**—Learners analyze ways that the perceived value and use of natural resources change over time and vary under different economic, political, social, and technological systems.
C. Places—Learners identify ways that places differ in their physical and human characteristics.	**C. Places**—Learners describe the meaning of "place" both close to home and around the world.	**C. Places**—Learners describe "place" as humans endowing a location with meaning and that this meaning can be created through individual and group interactions with that environment.
D. Change and conflict—Learners recognize that change is a normal part of individual and societal life. They describe examples of ways that conflict related to the environment or natural resources may be rooted in different points of view.	**D. Change and conflict**—Learners explain that human social systems are dynamic and that conflicts sometimes arise over differing and changing viewpoints about the environment and natural resource use and management.	**D. Change and conflict**—Learners analyze the functioning of public processes for promoting and managing change and conflict, and can evaluate their effects on the environment, society, and the economy.

STRAND ③

Skills for Understanding and Addressing Environmental Issues
3.1 Skills for Analyzing and Investigating Environmental Issues

GRADES K-4	GRADES 5-8	GRADES 9-12
A. Identifying and investigating issues—Learners identify and investigate issues in their local environment and community.	**A. Identifying and investigating issues**—Learners use primary and secondary sources of information and apply research and analytical skills to investigate environmental issues, beginning in their own community and region.	**A. Identifying and investigating issues**—Learners apply their research and analytical skills to systematically investigate environmental issues ranging from local issues to those that are regional or global in scope.
B. Sorting out the consequences of issues—Learners use their knowledge of how ecological and human systems are interconnected to describe the environmental, social, and economic consequences of local environmental issues.	**B. Sorting out the consequences of issues**—Learners apply their knowledge of ecological and human processes and systems to describe the short and long-term consequences of selected environmental issues on sustainability.	**B. Sorting out the consequences of issues**—Learners evaluate the consequences of a broad range of environmental changes, conditions, and issues on environmental quality and long-term sustainability. They identify environmental justice and social equity implications.
C. Identifying and critiquing alternative solutions and courses of action—Learners develop plans, including possible design solutions, for addressing selected local environmental issues.	**C. Identifying and critiquing alternative solutions and courses of action**—Learners identify and develop action strategies, including design solutions, appropriate for addressing a range of environmental issues at community and regional levels. They describe how their action strategies and design solutions might impact environmental quality and other people now and in the future.	**C. Identifying and critiquing alternative solutions and courses of action**—Learners identify and propose environmental action plans, including design solutions, and evaluate their likely effectiveness in specific environmental, cultural/social, and economic contexts. They identify ways that these action plans and design solutions might affect different groups of people, including possible environmental justice and social equity implications.
D. Working with flexibility, creativity, and openness—Learners demonstrate openness and receptivity while listening to and working with others who have perspectives about the environment that are different from their own.	**D. Working with flexibility, creativity, and openness**—Learners demonstrate active listening, tolerance, adaptability, and openness as they work with others to gather a range of perspectives and information.	**D. Working with flexibility, creativity, and openness**—Learners engage each other in evidence-based peer review and work collaboratively and cooperatively in the spirit of open deliberation, especially in contexts that bring to the surface deeply held priorities and values.

STRAND ③

Skills for Understanding and Addressing Environmental Issues

3.2 Decision-Making and Action Skills

GRADES K-4	GRADES 5-8	GRADES 9-12
A. Forming and evaluating personal views—Learners examine and express their own views on environmental issues.	**A. Forming and evaluating personal views**—Learners identify, justify, and clarify their views on environmental issues and alternative ways to address them.	**A. Forming and evaluating personal views**—Learners evaluate, justify, and communicate their own views on environmental issues and possible ways to address them.
B. Evaluating the need for action— Learners determine whether action is needed on selected environmental issues and whether they should be involved. They describe their reasoning.	**B. Evaluating the need for action**—Learners evaluate whether action is needed in specific situations, using environmental, cultural/social, and economic criteria. They decide whether they should be involved in that action.	**B. Evaluating the need for action**—Learners apply their research and analytical skills to systematically determine whether action is needed in specific environmental, cultural/social, and economic contexts and whether they should be involved.
C. Planning and taking action— Learners develop an action strategy or design solution for a specific local environmental issue of their choosing.	**C. Planning and taking action**— Learners use their research results to develop action strategies and design solutions at levels consistent with their maturity and preparation. As appropriate, they implement their plans.	**C. Planning and taking action**— Learners develop action strategies and design solutions based on their research and analysis of an environmental issue. If appropriate, they implement plans that are within the scope of their rights and consistent with their individual abilities and responsibilities as members of the community.
D. Evaluating the results of actions—Learners identify environmental, social, and economic consequences of design solutions and civic actions, including their own actions.	**D. Evaluating the results of actions**— Learners analyze the effects of design solutions, their own civic actions, and actions taken by other individuals and groups. They describe the short- and long-term effects of these actions and design solutions in terms of environmental, social, and economic consequences.	**D. Evaluating the results of actions**—Learners evaluate the intended and unintended consequences of design solutions, their own civic actions and actions taken by other individuals and groups, including environmental, social, and economic implications for long-term sustainability.

STRAND 4
Personal and Civic Responsibility

GRADES K-4

A. Recognizing rights and responsibilities—Learners describe their basic rights and responsibilities as members of a community and the importance of these rights and responsibilities in promoting environmental quality and community well-being.

B. Recognizing efficacy and developing agency—Learners describe how they can realistically and meaningfully contribute to their community and environmental quality.

C. Accepting personal responsibility—Learners identify ways in which they are responsible for the environmental, social, and economic effects of their actions.

GRADES 5-8

A. Recognizing rights and responsibilities—Learners explain the rights and responsibilities of community membership and their role in addressing environmental quality and sustainability.

B. Recognizing efficacy and developing agency—Learners possess a realistic self-confidence in their effectiveness as community members to make changes in their community that address environmental quality and sustainability.

C. Accepting personal responsibility—Learners describe the broad environmental, social, and economic consequences of their personal and group actions and as appropriate, accept responsibility for their actions.

GRADES 9-12

A. Recognizing rights and responsibilities—Learners describe the relationships between exercising their individual rights and responsibilities and addressing environmental quality and long-term sustainability.

B. Recognizing efficacy and developing agency—Learners exhibit personal agency by working independently and making choices to bring about change in their community that addresses environmental quality and long-term sustainability.

C. Accepting personal responsibility—Learners evaluate the broad environmental, social, and economic consequences of their actions. They accept responsibility for recognizing those effects and changing their actions when warranted.

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 in 1993 to help educators develop and deliver high-quality education programming. The project works to create a more environmentally literate citizenry with the knowledge, skills, and inclinations to make informed choices and exercise the rights and responsibilities of members of a community.

To date, NAAEE has published six 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

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

- *Environmental Education Materials: Guidelines for Excellence*. A set of recommendations for developing and selecting environmental education materials.

- *K-12 Environmental Education: Guidelines for Excellence* (2019). A comprehensive framework for environmental education, demonstrating benchmarks towards environmental literacy.

- *K-12 Environmental Education: Guidelines for Excellence Executive Summary* (2019). An easy-to-use outline listing the guidelines that can be used to compare performance expectations across grade levels.

- *Professional Development of Environmental Educators: Guidelines for Excellence* (5th edition, 2019). A set of competencies for educators preparing to teach environmental education in a variety of job settings.

- *Nonformal Environmental Education Programs: Guidelines for Excellence* (2nd edition, 2009). A set of recommendations to be used in the development of comprehensive environmental education programs or to trigger improvements in existing ones.

- *Early Childhood Environmental Education Programs: Guidelines for Excellence* (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). This set of guidelines focuses on community wellness and is designed to help environmental educators create inclusive environments that support effective partnerships and collaborations.

Hard copies and free downloadable pdfs of the *Environmental Education Guidelines* publications can be ordered from NAAEE at https://naaee.org/our-work/programs/guidelinesexcellence

Education We Need for the World We Want

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

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