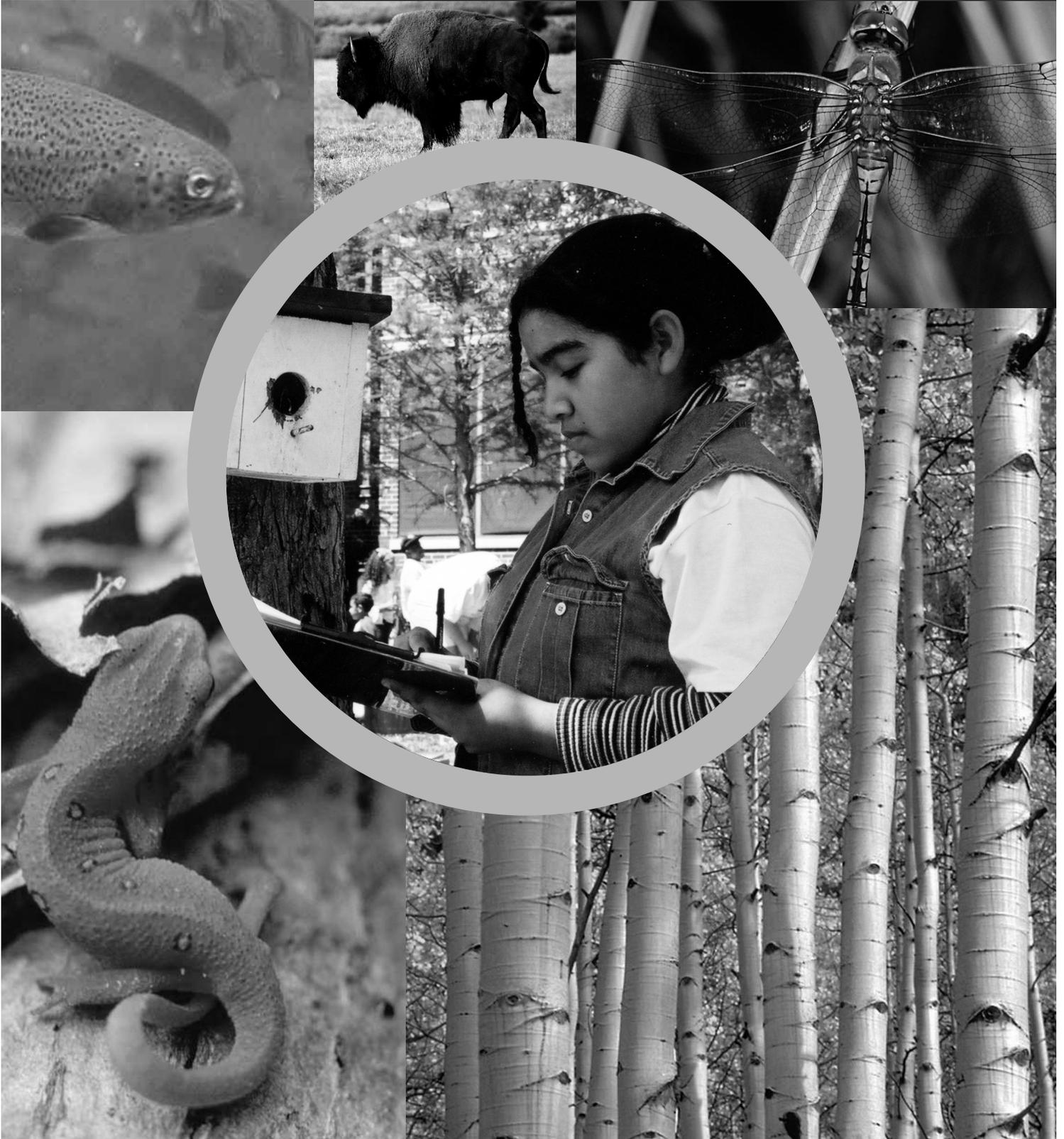


Project **WILD**<sup>®</sup>

# Correlations to the Excellence in Environmental Education: Guidelines for Learning







# Project **WILD**

***Correlations of Project WILD  
and Project WILD Aquatic K–12  
Curriculum & Activity Guides to  
Excellence in Environmental  
Education: Guidelines for Learning***

**Project WILD** is an interdisciplinary conservation and environmental education program emphasizing wildlife. The goal of Project WILD is to assist students of any age in developing awareness, knowledge, skills, and commitment to result in informed decisions, responsible behavior, and constructive actions concerning wildlife and the environment.

Project WILD is sponsored by the Council for Environmental Education with the Western

Association of Fish and Wildlife Agencies. The program is based on the premise that young people and their educators have a vital interest in learning about the Earth as home for people and wildlife. For instructional purposes Project WILD defines wildlife as any nondomesticated animal. Wildlife may be as small as a microscopic organism or as large as a great blue whale. Wildlife includes but is not limited to insects, spiders, birds, reptiles, fish, amphibians, and mammals.

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## INTRODUCTION

In order to meet the needs of educators nationwide, correlations of Project WILD K–12 materials have been developed for the North American Association for Environmental Education’s (NAAEE) *Excellence in Environmental Education: Guidelines for Learning* (the *Guidelines*).

The *Guidelines* identify knowledge and skills essential for environmental literacy and articulate how environmental education fits into formal classroom settings. The correlations document allows educators to identify which of the *Guidelines* are addressed by each Project WILD activity, in either the *Project WILD* or the *Project WILD Aquatic K–12 Curriculum and Activity Guide*.

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## HOW TO USE THIS DOCUMENT

- This document is separated into three sections based on grade level: K–4, 5–8 and 9–12.
- The complete *Guidelines* are provided in each grade level section, and are followed by charts correlating Project WILD activities to each guideline.
- Correlation charts include *Guideline* fundamental concepts in the left column and Project WILD activities (including grade level and page numbers) along the top row.
- Key to symbols:
  - The environmental education concept is the main focus of the Project WILD activity.
  - ◎ The environmental education concept is one of the main focuses of the Project WILD activity; is reinforced.
  - The environmental education concept is not the main focus of the Project WILD activity, but it is supported or reinforced.

## EXCELLENCE IN ENVIRONMENTAL EDUCATION: GUIDELINES FOR LEARNING, GRADES K–4

### **GUIDELINES FOR K–4TH GRADE**

*Learners should be able to meet the guidelines included in this section by the end of fourth grade.*

*The kindergarten through fourth grade years are a time of tremendous cognitive development. By third and fourth grades, learners have developed some basic skills that help them construct knowledge. Instructors in earlier grade levels should use these fourth grade guidelines as a target, extrapolating from this end goal appropriate activities and lessons for younger learners.*

*In these early years of formal education, learners tend to be concrete thinkers with a natural curiosity about the world around them. Environmental education can build on these characteristics by focusing on observation and exploration of the environment—beginning close to home.*

### **Examining Environmental Issues in Fourth Grade**

*Many educators believe that exploring issues helps fourth-grade learners make important links between conceptual understanding, what is happening in their community, and their own responsibility for environmental quality. Others caution that fourth graders are only beginning to synthesize their knowledge into the kind of complex understanding that is essential to examining environmental issues. When deciding how to handle environmental issues in the fourth grade classroom, educators must rely on their own judgment about what each class—and each student—is ready to handle.*

*Basic guidelines for examining environmental issues with fourth graders are:*

- *Keep it simple.*
- *Keep it local.*
- *Make close links with what they're observing and learning about the local environment.*

*Local solid waste and water issues easily fit these basic guidelines. They are especially appropriate for these young learners.*

## **STRAND 1—QUESTIONING, ANALYSIS AND INTERPRETATION SKILLS**

**A) Questioning**—Learners are able to develop questions that help them learn about the environment and do simple investigations.

- Identify questions they are likely to be able to answer by combining their own observations and investigations of the environment with existing information.
- Pose questions based on experiences in their own community and local environment as well as from other sources, such as journalistic reports about the environment.
- Generate ideas and questions about objects, organisms, events, places, and relationships in the environment.

**B) Designing investigations**—Learners are able to design simple investigations.

- Predict possible answers to their own questions, developing and discussing simple alternative hypotheses.
- Design ways of answering questions based on systematic observations. For example, devise a way to learn about the life cycle of a caterpillar or the means of transportation that children take to and from their school.
- Design simple experiments to answer questions and test ideas they have about the environment.

**C) Collecting information**—Learners are able to locate and collect information about the environment and environmental topics.

- Observe and record characteristics, differences, and change in objects, organisms, events, places, and relationships in the environment.
- Find, assess, select, and use resources such as atlases, data bases, charts, tables, graphs, and maps.
- Use basic field skills, such as observing, interviewing and measuring, to collect information.
- Use tools such as rulers, thermometers, watches, scales, magnifiers, and microscopes to make observations and measurements.
- Use computers, calculators and other devices to conduct investigations and manipulate information.

**D) Evaluating accuracy and reliability**—Learners understand the need to use reliable information to answer their questions. They are familiar with some basic factors to consider in judging the merits of information.

- Provide specific examples of information they believe to be factual, fictitious, or of questionable merit and explain their reasoning.
- Identify some factors that might influence the credibility of a specific source of information, for example, who created it, how old it is, and what kind of arguments or evidence are used.

**E) Organizing information**—Learners are able to describe data and organize information to search for relationships and patterns concerning the environment and environmental topics.

- Summarize observations and describe data.
- Construct, read, and interpret maps, graphs, tables, diagrams, and other displays of data.
- Identify patterns in events, designs, organisms, and sets of numbers.
- Describe mathematical relationships and use those relationships as a way of organizing data. For example, chart the relationship between plant growth and different amounts of water or sunlight.

**F) Working with models and simulations**—Learners understand that relationships, patterns, and processes can be represented by models.

- Interpret information and situations by noting associations and similarities, and recognizing patterns, trends, relationships, and sequences.
- Give examples of models or simulations and how they can be used to learn about what they represent.
- Identify ways in which a model differs from what it represents.
- Use a number of types of models such as geometric figures, graphs, and maps to summarize observations of the environment.

**G) Drawing conclusions and developing explanations**—Learners can develop simple explanations that address their questions about the environment.

- Summarize information, compare findings, and use basic mathematics to analyze data.
- Identify information that is not relevant to a proposed explanation and explain their reasoning.
- Use models and examples to explain their thinking.
- List strengths and weaknesses of the explanations they propose.

## **STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS**

### **Strand 2.1—The Earth as a Physical System**

**A) Processes that shape the Earth**—Learners are able to identify changes and differences in the physical environment.

- Identify some of the forces that cause erosion within their own region, pointing out factors such as freezing and thawing, wind, waves, and gravity.
- Identify some distinctive landforms within their region and, using maps and images, in other areas of the world.

- Differentiate among climates, considering factors such as precipitation, temperature, and resident plants and animals and how they form the different biomes.
- Observe and record seasonal differences. For example, draw a series of pictures or compile photographs that illustrate differences such as day length, migration of specific bird species, and when specific tree species lose their leaves.

**B) Changes in matter**—Learners are able to identify basic characteristics of and changes in matter.

- Describe objects in terms of the materials they are made of and their observable properties. For example, describe buildings constructed with different materials and discuss why these materials may have been selected based on such properties as rigidity, ability to reflect or gather heat, and transparency.
- Identify the effects of factors such as heating, cooling, and moisture on the properties of materials and how quickly change happens. For example, describe the change of water from solid to liquid to gas in the environment.
- Describe the basic elements of the hydrologic cycle and geologic processes (including weathering, erosion, and deposition). Locate examples of these in the local environment.

**C) Energy**—While they may have little understanding of formal concepts associated with energy, learners are familiar with the basic behavior of some different forms of energy.

- Identify different forms of energy including radiant light, geothermal, electrical, and magnetic energy. Identify examples of these different forms in their homes, school, community, and natural environment.
- Explain some of the ways in which heat, light, or electricity are produced, travel, stored and used. Use examples such as the sun, power generation, batteries, and so forth.

## **Strand 2.2—The Living Environment**

**A) Organisms, populations, and communities**—Learners understand basic similarities and differences among a wide variety of living organisms. They understand the concept of habitat.

- Identify similarities and differences among living organisms ranging from single-celled organisms they can observe under microscopes to plants and animals they encounter through direct observation, videos, books, or other media.
- Classify or group organisms using categories such as how animals bear their young, anatomical features, or habitats.
- Describe the basic needs of all living things and explain how organisms meet their needs in different types of environments such as deserts, lakes, or forests.

**B) Heredity and evolution**—Learners understand that plants and animals have different characteristics and that many of the characteristics are inherited.

- Identify some basic traits of plants and animals. Give examples of how those traits may vary among individuals of the same species.
- Identify some similarities among offspring and parents as being inherited and others as resulting from the organism's interactions with its environment.
- Compare fossil life forms and living organisms to identify similarities and differences between organisms that lived long ago and those alive today.

**C) Systems and connections**—Learners understand basic ways in which organisms are related to their environments and to other organisms.

- Describe ways in which an organism's behavior patterns are related to its environment. Identify examples of environmental change and discuss how these changes may be helpful or harmful to particular organisms.
- Identify ways in which organisms (including humans) cause changes in their own environments. Create a skit that shows how these changes may help or harm both the organisms that caused the change and other organisms.

- Identify ways in which organisms are interdependent. For example, some animals eat plants, some fish depend on other fish to keep them free of parasites, and earthworms keep soil loose and fertile, which makes it easy for plants to grow.

**D) Flow of matter and energy**—Learners know that living things need some source of energy to live and grow.

- Explain how most living organisms depend on the sun as the source of their life energy. Give examples that illustrate the understanding that animals ultimately depend on plants for this energy and that plants depend on the sun. Use this idea to trace the energy in the food they eat for lunch back to the sun.
- Describe how matter can be recycled, sometimes in a changed form from the original material. Use examples from their own experience, such as fleece jackets made from recycled soda bottles or envelopes made from recycled telephone books. Or make their own recycled paper and explain how the use of matter differs between making recycled paper and new (or “virgin”) paper.
- Explain the process of life, growth, death, and decay of living organisms as a form of recycling. For example, use a compost pile to study recycling of organic materials.

### **Strand 2.3—Humans and Their Societies**

**A) Individuals and groups**—Learners understand that people act as individuals and as group members and that groups can influence individual actions.

- Give examples of influences on individual behavior, particularly behavior that affects the environment. For example, discuss why a person might choose to dispose of household garbage, candy wrappers, or toxic products in certain ways. Consider influences such as financial costs, convenience, laws, and the opinions of friends and family members.
- Identify some of the many groups that a person can belong to at the same time. Describe some tensions that a person might feel as a result of belonging to different groups.
- Discuss why students might belong to school or after-school clubs (such as environmental clubs or scouting troops). Consider personal benefits (such as fun and learning) as well as good things the clubs do for the whole school or community.

**B) Culture**—Learners understand that experiences and places may be interpreted differently by people with different cultural backgrounds, at different times, or with other frames of reference.

- Describe their favorite place or their own community from a variety of perspectives, including their own.
- Role-play the reactions of different people to a place or historical event—especially one with local significance.
- Compare how people live in different regions and how different cultures meet basic human needs. For example, prepare a visual display that compares how people support themselves in different regions and discuss how those livelihoods can both affect the environment and depend on the environment.

**C) Political and economic systems**—Learners understand that government and economic systems exist because people living together in groups need ways to do things such as provide for needs and wants, maintain order, and manage conflict.

- Discuss what might happen if there were no laws to protect the environment in their area. Consider possible positive and negative effects on plants and animals, specific natural areas, landowners, specific businesses, water users, and others.
- List jobs in their community that are linked to processing natural resources. Identify clusters of related businesses and interview employees or owners to determine why those economic activities are located in their community.
- Identify elements of infrastructure (e.g. communications and transportation systems) in their community. For example, create a map or a skit showing how information, people, and goods move from place to place. Include information about who is responsible for, or who pays for, this infrastructure (e.g., the government, private business, individuals).

**D) Global connections**—Learners understand how people are connected at many levels—including the global level—by actions and common responsibilities that concern the environment.

- Identify ways in which individual needs and wants are related to environmental concerns such as energy use, conservation and environmental protection.
- Describe how trade connects people around the world and enables them to have things they might not be able or willing to produce themselves. For example, create a map that shows where a learner’s food, clothing and household items are produced, where the raw materials come from, products that are traded into and out from their region, and so forth.
- Identify possible environmental concerns that might come up in other regions or countries as a result of producing or shipping products that learners use regularly.
- Discuss how television, computers, and other forms of communication connect people around the world.

**E) Change and conflict**—Learners recognize that change is a normal part of individual and societal life. They understand that conflict is rooted in different points of view.

- Identify aspects of family and community life that have remained constant over generations, as well as aspects that have changed. For example, interview family or community members and develop a visual display about their findings.
- Give examples of rules related to the environment at home, in school, or elsewhere that have changed and others that have stayed the same.
- Identify some basic ways in which individuals, groups, and institutions such as schools resolve conflict concerning the environment. For example, develop and perform short skits about different ways of solving a school problem such as littering on the playground or in hallways.

## **Strand 2.4—Environment and Society**

**A) Human/environment interactions**—Learners understand that people depend on, change, and are affected by the environment.

- Identify ways in which people depend on the environment. For example, create an artistic representation of how the environment provides food, water, air, recreation, minerals, and other resources.
- Identify ways in which human actions change the environment. For example, list changes that activities such as building houses or stores with parking lots, farming, or damming rivers have caused within their community or region.
- Describe how the environment affects human activities in their community or region. For example, describe the effects of weather or climate, the likelihood of earthquakes or flooding, soil and mineral types, or the presence of water on where people live, how they make a living, how they recreate, and so forth.

**B) Places**—Learners understand that places differ in their physical and human characteristics.

- Identify and describe places in their region that they or others think are important. For example, draw pictures, create a video, or take photographs that illustrate what people find unique or important about regional landmarks, downtown areas, parks, farms, wilderness areas, and so forth.
- Discuss how humans create places that reflect their ideas, needs, and wants, as well as the physical environment. Illustrate with examples of places within their experience such as playgrounds, parks, classrooms, and homes.
- Compare their neighborhood or town with another nearby place, or compare their favorite park with another park they know. List characteristics that make one place different from another.

**C) Resources**—Learners understand the basic concepts of resource and resource distribution.

- Explain what a natural resource is and give examples.
- Distinguish among resources that are renewable and nonrenewable, and resources (like running water or wind) that are available only in certain places at certain times.
- Identify ways they use resources in their daily lives.

- Locate sources of various resources on a map. For example, trace the origins of the local water supply or map the region’s natural resources.
- Link patterns of human settlement and other activity with the presence of specific resources such as mineral deposits, rivers, or fertile farming areas. Research the origins of their own community and explain the role of resource availability on how the community developed.

**D) Technology**—Learners understand that technology is an integral part of human existence and culture.

- Describe technologies as tools and ways of doing things that humans have invented. Give examples of technologies that affect their lives in areas such as transportation, communications, and entertainment.
- Interview family members or community members to trace technological changes that have taken place over the last three generations.
- Identify drawbacks and benefits of specific technologies. Consider the fact that technologies can benefit some humans and other organisms while harming others.
- Identify important technological systems such as agriculture, transportation, and manufacturing.

**E) Environmental issues**—Learners are familiar with some local environmental issues and understand that people in other places experience environmental issues as well.

- Discuss some local environmental issues by identifying some changes or proposals that people disagree about. Describe or role-play how different people feel about these changes and proposals.
- Discuss how people in other places with similar conditions might react or perceive the situation in similar ways.

## **STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES**

### **Strand 3.1—Skills for Analyzing and Investigating Environmental Issues**

**A) Identifying and investigating issues**—Learners are able to identify and investigate issues in their local environments and communities.

- Identify and describe a current or historical environmental issue in their community.
- Use primary and secondary sources of information to explore the dilemma confronting people in a current or historical situation that involves the environment.
- Apply ideas of past, present, and future to local environmental issues. For example, describe what has changed, is changing, and could change or discuss how long the issue has existed.
- Identify people and groups that are involved.
- Identify some of the decisions and actions related to the issue.

**B) Sorting out the consequences of issues**—As learners come to understand that environmental and social phenomena are linked, they are able to explore the consequences of issues.

- Observe and speculate about social, economic, and environmental effects of environmental changes and conditions, and proposed solutions to issues. For example, describe short-term and long-term effects of existing uses of land or another resource in the home, community, and region.
- Discuss how an environmental issue affects different individuals and groups.

**C) Identifying and evaluating alternative solutions and courses of action**—Learners understand there are many approaches to resolving issues.

- Identify proposed solutions to an issue and discuss arguments for and against them.
- Explain why various strategies may be effective in different situations, and that each proposed strategy is likely to have a different effect on society and the environment. Illustrate with examples from a specific issue.
- Describe some of the different levels at which action can be taken—for example by individuals, families, school classes, different levels of government, or businesses. Identify ways that these groups might take action on a specific issue.
- Propose alternative approaches to problems.

**D) Working with flexibility, creativity, and openness**—Learners understand the importance of sharing ideas and hearing other points of view.

- Engage in critique and discussion as part of the process of inquiry. Explain why these processes are important.
- Hear and respect different perspectives and communicate with people whose lives, cultures, and viewpoints are different from their own.
- Identify ideas and interpretations that differ from theirs. Ask questions about different perspectives and discuss their strong points and drawbacks.

### **Strand 3.2—Decision-Making and Citizenship Skills**

**A) Forming and evaluating personal views**—Learners are able to examine and express their own views on environmental issues.

- Identify and express their own ideas about environmental issues and alternative ways to address them.
- Test their views against what they know and believe, remaining open to new information and ideas.
- Identify unanswered questions.
- Identify, clarify, and express their own beliefs and values regarding the environment.

**B) Evaluating the need for citizen action**—Learners are able to think critically about whether they believe action is needed in particular situations and whether they believe they should be involved.

- Discuss whether citizens should take action on a particular environmental issue. Consider findings from their issue investigations such as causes of the problem and promising strategies for addressing it.
- Identify types of citizen action appropriate for a specific issue.
- Discuss whether and how they think they would like to be involved. Identify reasons for and against taking specific kinds of action.

**C) Planning and taking action**—By participating in issues of their choosing—mostly close to home—they learn the basics of individual and collective action.

- Develop action plans they can carry out individually, in small groups, or as a class. Include clear reasons and goals for action. Consider the results of their environmental issue investigation and their assessment of the need for action.
- Set realistic goals for action and measures of success consistent with learners’ abilities.
- Decide whether their plan should be implemented immediately or at another time, changed, or abandoned; and carry through with action when appropriate.

**D) Evaluating the results of actions**—Learners understand that civic actions have consequences.

- Describe the apparent effects of their own actions and actions taken by other individuals and groups.
- Discuss some of the reasons why identifying the effects of actions may be difficult. Consider, for example, the time required to see effects, the influences of others’ actions, and other changes in the situation.

### **Strand 4—Personal and Civic Responsibility**

**A) Understanding societal values and principles**—Learners can identify fundamental principles of U.S. society and explain their importance in the context of environmental issues.

- Identify examples of beliefs that many U.S. citizens hold in common, such as the importance of individual property rights, the right to pursue happiness, the public or common good, and the well-being of future generations. Create a skit that explores why people might decide to act on environmental issues, considering possible connections with these basic beliefs.

- Discuss how their own beliefs about the environment, environmental issues, and society compare to these general, societal beliefs.
- Recognize tensions that occur when basic values and beliefs differ. Illustrate with examples from local environmental issues.

**B) Recognizing citizens' rights and responsibilities**—Learners understand the basic rights and responsibilities of citizenship.

- Identify examples of the personal, political, and economic rights of U.S. citizens.
- Identify examples of the responsibilities of citizenship.
- Discuss rights and responsibilities in the context of local environmental issues.

**C) Recognizing efficacy**—Learners possess a realistic self-confidence in their effectiveness as citizens.

- Describe ways in which individuals and groups act within their community to protect the environment. Identify cases where citizen action has had an effect on an environmental decision or action.
- Identify ways in which they have made a difference through their own actions. Give examples from situations over which learners have some control (for example, in the classroom, at home, or in the community) and that are appropriate to their level of understanding.

**D) Accepting personal responsibility**—Learners understand that they have responsibility for the effects of their actions.

- Identify and describe some of the effects that they and the groups they belong to (e.g., family or school class) have on the environment and on humans and other living beings.
- Discuss the notion of responsibility and identify some of their personal responsibilities.

| <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>Key to Symbols:</b> <ul style="list-style-type: none"> <li>● The EE concept is the main focus of the Project WILD activity.</li> <li>⊙ The concept is one of the main focuses of the activity; is reinforced.</li> <li>○ The concept is not the main focus of the activity, but it is supported or reinforced.</li> </ul> </div> <b>ENVIRONMENTAL EDUCATION GUIDELINES FOR LEARNING, K–4</b> | Color Crazy (gr. K–4, p. 2) | Grasshopper Gravity (gr. K–4, p. 4) | What’s Wild? (gr. K–4, p. 7) | Classroom Carrying Capacity (gr. K–4, p. 9) | Graphanimal (gr. Pre-K–4, p. 49) | Wildlife Is Everywhere! (gr. K–4, p. 51) | Habitacks (gr. K–4, p. 53) | What’s That, Habitat? (gr. K–4, p. 56) | Beautiful Basics (gr. K–4, p. 58) | Everybody Needs a Home (gr. K–4, p. 59) | Environmental Barometer (gr. Pre-K–4, p. 77) | Habitrekking (gr. 3–4, p. 79) |
|--|-----------------------------|-------------------------------------|------------------------------|---|----------------------------------|--|----------------------------|--|-----------------------------------|---|--|-------------------------------|
| <b>STRAND 1—QUESTIONING AND ANALYSIS SKILLS</b>  |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| A. Questioning   |                             | ⊙                                   |                              | ⊙   |                                  |  |                            | ○                                      |                                   |   |  | ○                             |
| B. Designing investigations  | ○                           | ⊙                                   | ○                            |   | ⊙                                | ○  | ○                          | ○                                      |                                   |   | ⊙  | ⊙                             |
| C. Collecting information  |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| D. Evaluating accuracy and reliability   |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| E. Organizing information  |                             | ⊙                                   | ○                            | ○   | ⊙                                |  | ○                          |  | ○                                 | ○                                       | ⊙  | ⊙                             |
| F. Working with models and simulations   | ○                           |                                     |                              | ⊙   | ○                                |  |                            |  |                                   | ⊙                                       |  |                               |
| G. Developing explanations   | ○                           |                                     |                              | ○   | ○                                |  |                            |  | ○                                 | ○                                       | ○  | ○                             |
| <b>STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS</b>   |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| <b>2.1—The Earth as a Physical System</b>  |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| A. Processes that shape the Earth  |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| B. Changes in matter   |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| C. Energy  |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| <b>2.2—The Living Environment</b>  |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| A. Organisms, populations, and communities   |                             | ○                                   | ○                            | ○   |                                  | ○  | ⊙                          | ●                                      | ⊙                                 | ○                                       |  | ⊙                             |
| B. Heredity and evolution  | ○                           | ○                                   |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| C. Systems and connections   | ○                           |                                     | ○                            | ⊙   | ○                                | ○  | ○                          | ○                                      | ○                                 | ○                                       | ○  | ○                             |
| D. Flow of matter and energy   |                             |                                     |                              | ○   |                                  |  |                            | ○                                      | ○                                 | ○                                       |  |                               |
| <b>2.3—Humans and Their Societies</b>  |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| A. Individuals and groups  |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| B. Culture   |                             |                                     |                              |   |                                  |  |                            |  |                                   | ○                                       |  |                               |
| C. Political and economic systems  |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| D. Global connections  |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| E. Change and conflict   |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |

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|---|-----------------------------|-------------------------------------|------------------------------|---|----------------------------------|--|----------------------------|--|-----------------------------------|---|--|-------------------------------|
| <b>2.4—Environment and Society</b>  |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| A. Human/environment interactions   |                             |                                     | ○                            | ⊙   |                                  | ○  |                            | ⊙                                      | ○                                 | ○                                       |  | ○                             |
| B. Places   |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| C. Resources  |                             |                                     |                              |   |                                  |  |                            | ○                                      |                                   |   |  |                               |
| D. Technology   |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| E. Environmental issues   |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| <b>STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES</b>  |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| <b>3.1—Skills for Analyzing and Investigating Environmental Issues</b>  |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| A. Identifying and investigating issues   |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| B. Sorting out the consequences of issues   |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| C. Identifying and evaluating alternative solutions and courses of action   |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| D. Working with flexibility, creativity, and openness   |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| <b>3.2—Decision-Making and Citizenship Skills</b>   |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| A. Forming and evaluating personal views  |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| B. Evaluating the need for citizen action   |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| C. Planning and taking action   |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| D. Evaluating the results of actions  |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| <b>STRAND 4—PERSONAL AND CIVIC RESPONSIBILITY</b>   |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| A. Understanding societal values and principles   |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| B. Recognizing citizens' rights and responsibilities  |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| C. Recognizing efficacy   |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |
| D. Accepting personal responsibility  |                             |                                     |                              |   |                                  |  |                            |  |                                   |   |  |                               |

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|---|--|--|---|--|---|---|---------------------------------------|---|---|---|--|--|
| <b>STRAND 1—QUESTIONING AND ANALYSIS SKILLS</b>   |  |  |   |  |   |   |                                       |   |   |   |  |  |
| A. Questioning  |  |  |   |  |   |   |                                       |   |   |   |  |  |
| B. Designing investigations   |  | ○  |   |  |   |   |                                       |   |   |   |  |  |
| C. Collecting information   |  | ○  |   |  |   |   |                                       | ○   |   |   |  |  |
| D. Evaluating accuracy and reliability  |  |  |   |  | ○   | ○   |                                       |   |   |   |  |  |
| E. Organizing information   | ○  | ○  | ○   |  |   |   |                                       |   |   |   |  |  |
| F. Working with models and simulations  | ⊙  | ○  |   |  |   |   | ○                                     |   |   | ○   |  |  |
| G. Developing explanations  | ○  |  |   |  |   |   | ○                                     |   |   |   |  |  |
| <b>STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS</b>  |  |  |   |  |   |   |                                       |   |   |   |  |  |
| <b>2.1—The Earth as a Physical System</b>   |  |  |   |  |   |   |                                       |   |   |   |  |  |
| A. Processes that shape the Earth   |  |  |   |  |   |   |                                       |   |   |   |  |  |
| B. Changes in matter  |  |  |   |  |   |   |                                       |   |   |   |  |  |
| C. Energy   |  |  |   |  |   |   |                                       |   |   |   |  |  |
| <b>2.2—The Living Environment</b>   |  |  |   |  |   |   |                                       |   |   |   |  |  |
| A. Organisms, populations, and communities  | ○  | ⊙  | ⊙   | ○  |   |   |                                       |   | ○   | ○   |  |  |
| B. Heredity and evolution   |  |  |   | ○  |   |   |                                       |   |   |   |  |  |
| C. Systems and connections  | ○  |  | ⊙   | ○  |   |   |                                       |   | ○   | ○   |  |  |
| D. Flow of matter and energy  | ○  |  |   |  |   |   | ⊙                                     |   |   |   |  |  |
| <b>2.3—Humans and Their Societies</b>   |  |  |   |  |   |   |                                       |   |   |   |  |  |
| A. Individuals and groups   |  |  |   |  |   |   |                                       |   |   |   | ○                                      |  |
| B. Culture  |  |  |   |  |   |   |                                       |   |   |   |  |  |
| C. Political and economic systems   |  |  |   |  |   |   |                                       |   |   |   |  |  |
| D. Global connections   |  |  |   |  |   |   | ○                                     |   |   |   |  |  |
| E. Change and conflict  |  |  |   |  |   |   |                                       |   |   |   |  |  |

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|--|--|--|---|--|---|---|--|--|---|---|---|--|
| <b>2.4—Environment and Society</b>   |  |  |   |  |   |   |  |  |   |   |   |  |
| A. Human/environment interactions  |  |  |   |  |   |   | ○  |  |   | ○   | ○   | ⦿  |
| B. Places  |  |  |   |  |   |   |  |  |   |   |   |  |
| C. Resources   |  |  |   |  |   |   |  |  |   |   |   | ○  |
| D. Technology  |  |  |   |  |   |   |  |  |   |   |   |  |
| E. Environmental issues  |  |  |   |  |   |   |  |  |   |   |   |  |
| <b>STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES</b>   |  |  |   |  |   |   |  |  |   |   |   |  |
| <b>3.1—Skills for Analyzing and Investigating Environmental Issues</b>   |  |  |   |  |   |   |  |  |   |   |   |  |
| A. Identifying and investigating issues  |  |  |   |  |   |   |  |  |   |   |   |  |
| B. Sorting out the consequences of issues  |  |  |   |  |   |   |  |  |   |   | ⦿   |  |
| C. Identifying and evaluating alternative solutions and courses of action  |  |  |   |  |   |   |  |  |   |   |   |  |
| D. Working with flexibility, creativity, and openness  |  |  |   |  |   |   |  |  |   |   |   |  |
| <b>3.2—Decision-Making and Citizenship Skills</b>  |  |  |   |  |   |   |  |  |   |   |   |  |
| A. Forming and evaluating personal views   |  |  |   |  |   |   |  |  |   |   | ○   | ○  |
| B. Evaluating the need for citizen action  |  |  |   |  |   |   |  |  |   |   |   |  |
| C. Planning and taking action  |  |  |   |  |   |   |  |  |   |   |   |  |
| D. Evaluating the results of actions   |  |  |   |  |   |   |  |  |   |   |   |  |
| <b>STRAND 4—PERSONAL AND CIVIC RESPONSIBILITY</b>  |  |  |   |  |   |   |  |  |   |   |   |  |
| A. Understanding societal values and principles  |  |  |   |  |   |   |  |  |   |   | ○   | ○  |
| B. Recognizing citizens’ rights and responsibilities   |  |  |   |  |   |   |  |  |   |   | ○   | ○  |
| C. Recognizing efficacy  |  |  |   |  |   |   |  |  |   |   | ○   | ○  |
| D. Accepting personal responsibility   |  |  |   |  |   |   |  |  |   |   | ○   | ○  |

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|---|-----------------------------|-----------------------------|----------------------------------|---------------------------------|---------------------------------|---------------------------------|-----------------------------------|-------------------------------------|--------------------------------------|
| <b>STRAND 1—QUESTIONING AND ANALYSIS SKILLS</b>   |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| A. Questioning  |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| B. Designing investigations   |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     | ○                                    |
| C. Collecting information   |                             |                             |                                  |                                 | ○                               |                                 | ○                                 |                                     | ○                                    |
| D. Evaluating accuracy and reliability  |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| E. Organizing information   |                             |                             |                                  | ○                               |                                 |                                 |                                   | ⊙                                   | ○                                    |
| F. Working with models and simulations  |                             |                             |                                  | ⊙                               |                                 | ⊙                               |                                   |                                     | ⊙                                    |
| G. Developing explanations  |                             |                             |                                  | ○                               |                                 |                                 |                                   |                                     |                                      |
| <b>STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS</b>  |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| <b>2.1—The Earth as a Physical System</b>   |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| A. Processes that shape the Earth   |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     | ○                                    |
| B. Changes in matter  |                             |                             |                                  |                                 |                                 |                                 |                                   | ○                                   |                                      |
| C. Energy   |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| <b>2.2—The Living Environment</b>   |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| A. Organisms, populations, and communities  | ○                           |                             | ○                                | ○                               | ⊙                               | ○                               |                                   |                                     |                                      |
| B. Heredity and evolution   | ●                           |                             |                                  |                                 | ⊙                               |                                 |                                   |                                     |                                      |
| C. Systems and connections  | ○                           |                             | ○                                | ⊙                               | ○                               | ○                               |                                   |                                     | ○                                    |
| D. Flow of matter and energy  |                             |                             | ○                                |                                 |                                 |                                 | ○                                 | ○                                   |                                      |
| <b>2.3—Humans and Their Societies</b>   |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| A. Individuals and groups   |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     | ⊙                                    |
| B. Culture  |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| C. Political and economic systems   |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| D. Global connections   |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| E. Change and conflict  |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |

| <p><b>Key to Symbols:</b></p> <ul style="list-style-type: none"> <li>● The EE concept is the main focus of the Project WILD activity.</li> <li>⊙ The concept is one of the main focuses of the activity; is reinforced.</li> <li>○ The concept is not the main focus of the activity, but it is supported or reinforced.</li> </ul> <p><b>ENVIRONMENTAL EDUCATION GUIDELINES FOR LEARNING, K–4</b></p> | Are You Me? (gr. K–4, p. 2) | Aqua Words (gr. K–4, p. 29) | Water Plant Art (gr. K–4, p. 31) | Marsh Munchers (gr. K–4, p. 34) | Fashion a Fish (gr. K–4, p. 56) | Sockeye Scents (gr. 3–4, p. 61) | Water We Eating? (gr. K–4, p. 83) | Plastic Jellyfish (gr. K–4, p. 128) | Silt: A Dirty Word (gr. 3–4, p. 176) |
|--|-----------------------------|-----------------------------|----------------------------------|---------------------------------|---------------------------------|---------------------------------|-----------------------------------|-------------------------------------|--------------------------------------|
| <b>2.4—Environment and Society</b>   |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| A. Human/environment interactions  |                             | ⊙                           | ○                                |                                 |                                 |                                 |                                   | ○                                   |                                      |
| B. Places  |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| C. Resources   |                             |                             |                                  |                                 |                                 |                                 | ⊙                                 |                                     |                                      |
| D. Technology  |                             |                             |                                  |                                 |                                 |                                 |                                   | ○                                   |                                      |
| E. Environmental issues  |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| <b>STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES</b>   |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| <b>3.1—Skills for Analyzing and Investigating Environmental Issues</b>   |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| A. Identifying and investigating issues  |                             |                             |                                  |                                 |                                 |                                 |                                   | ○                                   |                                      |
| B. Sorting out the consequences of issues  |                             |                             |                                  |                                 |                                 |                                 |                                   | ○                                   |                                      |
| C. Identifying and evaluating alternative solutions and courses of action  |                             |                             |                                  |                                 |                                 |                                 |                                   | ○                                   |                                      |
| D. Working with flexibility, creativity, and openness  |                             |                             |                                  |                                 |                                 |                                 |                                   | ○                                   |                                      |
| <b>3.2—Decision-Making and Citizenship Skills</b>  |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| A. Forming and evaluating personal views   |                             |                             |                                  |                                 |                                 |                                 |                                   | ○                                   |                                      |
| B. Evaluating the need for citizen action  |                             |                             |                                  |                                 |                                 |                                 |                                   | ○                                   |                                      |
| C. Planning and taking action  |                             |                             |                                  |                                 |                                 |                                 |                                   | ○                                   |                                      |
| D. Evaluating the results of actions   |                             |                             |                                  |                                 |                                 |                                 |                                   | ○                                   |                                      |
| <b>STRAND 4—PERSONAL AND CIVIC RESPONSIBILITY</b>  |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| A. Understanding societal values and principles  |                             |                             |                                  |                                 |                                 |                                 |                                   |                                     |                                      |
| B. Recognizing citizens’ rights and responsibilities   |                             |                             |                                  |                                 |                                 |                                 |                                   | ○                                   |                                      |
| C. Recognizing efficacy  |                             |                             |                                  |                                 |                                 |                                 |                                   | ○                                   |                                      |
| D. Accepting personal responsibility   |                             |                             |                                  |                                 |                                 |                                 |                                   | ○                                   |                                      |

## EXCELLENCE IN ENVIRONMENTAL EDUCATION: GUIDELINES FOR LEARNING, GRADES 5–8

### **GUIDELINES FOR 5–8<sup>TH</sup> GRADES**

*Learners should be able to meet the guidelines included in this section by the end of eighth grade.*

*In the fifth through eighth grades, learners begin to develop skills in abstract thinking and continue to develop creative thinking skills—and along with these, the ability to understand the interplay of environmental and human social systems in greater depth. Environmental education can foster this development by focusing on investigation of local environmental systems, problems, and issues. As learners become actively engaged in deciding for themselves what is right and wrong, educators can use environmental problems to help learners explore their own responsibilities and ethics.*

### **STRAND 1—QUESTIONING, ANALYSIS AND INTERPRETATION SKILLS**

**A) Questioning**—Learners are able to develop, focus, and explain questions that help them learn about the environment and do environmental investigations.

- Identify environmental questions based on personal experiences both in and outside school, newspaper and magazine articles, television or radio news, or videos.
- Summarize an environmental problem or situation to provide context for, or explain the origin of, a particular question. Create visual presentations (such as maps, graphs, or video tapes) and written and oral statements that describe their thinking about the problem.
- Pose clear questions and ideas to test (hypotheses), reformulating them when necessary.
- Clarify their own beliefs about the environment and discuss how those beliefs are reflected in the questions they ask.

**B) Designing investigations**—Learners are able to design environmental investigations to answer particular questions—often their own questions.

- Select types of inquiry appropriate to their questions.
- Define the scope of their inquiry, identifying the main variables and phenomena to be studied.
- Select appropriate systems of measurement and observation.
- Select tools that are appropriate for their environmental investigations based on the question asked and the type of information sought.

**C) Collecting information**—Learners are able to locate and collect reliable information about the environment or environmental topics using a variety of methods and sources.

- Observe systematically, measure accurately, and keep thorough and accurate records, which may include written notes and data tables, sketches, and photographs.
- Understand and use various systems of measurement and derived measurements such as rates.
- Assess, choose, and synthesize materials from resources such as aerial photographs, topographic maps, and satellite images; library and museum collections, historical documents, and eyewitness accounts; computerized databases and spreadsheets; the internet; and government records.
- Collect firsthand information about their own community using field study skills.

**D) Evaluating accuracy and reliability**—Learners are able to judge the weaknesses and strengths of the information they are using.

- Identify and evaluate vague claims they hear on television or through other media. For example, examine the credibility of results of public opinion polling about environmental topics, considering such factors as sampling methods, logical conclusions, and appropriate analogies.

- Identify factors that affect the credibility of information, including assumptions and procedures used to create it; the social, political, and economic context in which the information was created; and potential bias due to omission, suppression, or invention of factual information.
- Examine evidence, identify faulty reasoning, and apply other basic logic and reasoning skills in evaluating information sources.
- Identify gaps in information that indicate a need for further discovery or inquiry.
- Evaluate data and evidence for accuracy, relevance, significance, appropriateness, and clarity.

**E) Organizing information**—Learners are able to classify and order data, and to organize and display information in ways that help analysis and interpretation.

- Present environmental data in a variety of formats including charts, tables, plots, graphs, maps, and flow charts. For example, chart stream flows, create a map of local businesses that require air quality permits, or organize survey results into a table.
- Explain why they chose specific ways of ordering and displaying information. Consider factors such as the question being answered, the type of information, and the purpose of the display.
- Present environmental data in ways that demonstrate possible relationships between sets of information such as population census counts of a certain bird species and the prevalence of certain tree species or habitat types.

**F) Working with models and simulations**—Learners understand many of the uses and limitations of models.

- Describe how models are used to think about long-term processes such as population growth or processes that are difficult to see such as bird migration or the movement of the planets in relationship to the sun.
- Use models to represent and investigate aspects of the physical world such as weather and specific phenomena such as hurricanes.
- Manipulate mathematical and physical models using a computer.
- Evaluate models based on the question being investigated. Account for variables such as the complexity of the model, its scale, its ability to represent important features of the process being modeled, and its reliability and accuracy.
- Recognize limitations of models and simulations. For example, describe a situation in which a model of an environmental phenomenon is not useful.

**G) Drawing conclusions and developing explanations**—Learners are able to synthesize their observations and findings into coherent explanations.

- Distinguish between description and explanation and give examples of each based on their own environmental investigations.
- Consider the possible relationships among two or more variables.
- Propose explanations based on what they observed or learned through research, selecting which evidence to use and accounting for discrepancies. Synthesize and interpret information from a range of sources.
- List strengths and weaknesses of proposed explanations. Discuss how the proposed explanation could be rejected or its reliability improved.
- Use their proposed explanations to form new questions and suggest new avenues of inquiry.

## **STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS**

### **Strand 2.1—The Earth as a Physical System**

**A) Processes that shape the Earth**—Learners have a basic understanding of most of the physical processes that shape the Earth. They are able to explore the origin of differences in physical patterns.

- Analyze physical patterns such as climate, areas of geothermal activity, soil types, and arid regions, suggesting reasons for these patterns. Explain these patterns in terms of abrupt forces (such as earthquakes or major storms) and long-term processes (such as erosion and rock formation), as well as those that are human-caused (such as suburban development or agricultural practices).

- Predict the consequences of specific physical phenomena such as a hurricane in a coastal area or heavy grazing in an arid region.
- Relate physical processes and patterns (such as climate, weather phenomena, and seasonal change) to the Earth/sun relationship. For example, create a model that shows how seasonal change is affected by the Earth/sun relationship.

**B) Changes in matter**—Learners understand the properties of the substances that make up objects or materials found in the environment.

- Describe a variety of chemical reactions and offer examples from daily life and the local environment.
- Explain properties of materials in terms such as atomic and molecular structure or reactivity. For example, describe why particular building materials have properties such as rigidity, impermeability, or the ability to reflect or gather heat.
- Explain an object’s characteristics based on its composition and how it was formed. For example, describe the characteristics of different types of rock and account for these characteristics based on their constituent parts and the processes by which they were formed.

**C) Energy**—Learners begin to grasp formal concepts related to energy by focusing on energy transfer and transformations. They are able to make connections among phenomena such as light, heat, magnetism, electricity, and the motion of objects.

- Trace the flow of energy in examples that encompass several different transfers and transformations of energy. For example, trace the path of energy in the creation and consumption of fossil fuels.
- Explain how solar energy contributes to the movement of global air masses, the hydrological cycle and ocean currents.
- Explain how the process of life is based on the conversion, utilization, storage and transfer of energy. For example, create a visual display that shows how plants or animals use energy, where that energy comes from, and where it goes.

## **Strand 2.2—The Living Environment**

**A) Organisms, populations, and communities**—Learners understand that biotic communities are made up of plants and animals that are adapted to live in particular environments.

- Define and give examples to illustrate the concepts of species, population, community, and ecosystem. Trace and give examples of connections among organisms at those levels of organization.
- Link features of internal and external anatomy with the ability of organisms to make or find food and reproduce in particular environments.
- Understand that some animals and plants have adapted to extreme environmental conditions. Give examples of adaptations that are behavioral (for example, the migration of Canada geese and other birds) and physical (such as the physical structures that enable desert animals and plants to exist on minimal amounts of water).
- Describe how organisms differ in how they use energy. For example, identify organisms that use energy quickly for growth and metabolism, and therefore must replace it quickly (e.g., a hummingbird) and others that use energy more slowly and therefore need to replace it less frequently (e.g., a python). Predict the habitat needs of these different types of organisms.

**B) Heredity and evolution**—Learners have a basic understanding of the importance of genetic heritage.

- Describe some ways in which variation among individuals of the same species can sometimes give certain individuals an advantage within a specific environment.
- Describe in general terms the theory of natural selection for particular traits and how that process can result in descendants that are quite different from their ancestors.
- Define extinction, cite evidence of extinction, and identify some of its causes.
- Discuss the possible implications of permanent loss of a species and how it affects interdependence within an ecosystem.

**C) Systems and connections.** Learners understand major kinds of interactions among organisms or populations of organisms.

- Describe and give examples of producer/consumer, predator/prey, and parasite/host relationships.
- Identify organisms that are scavengers or decomposers. Describe the roles they play within particular systems focusing on their relationship to other organisms and physical elements of the system.
- Summarize how abiotic and biotic components in combination influence the structure of an ecosystem. For example, create a map for the local region that shows average temperature and rainfall correlated with local forest, grassland or desert ecosystems. Or discuss the process of soil formation in terms of the interaction of climate, geology, and living organisms.

**D) Flow of matter and energy—** Learners understand how energy and matter flows among the abiotic and biotic components of the environment.

- Trace the flow of energy through food webs that identify relationships among organisms in natural systems.
- Explain how matter is transferred among organisms and between organisms and their environment in these food webs.
- Describe how energy, which enters ecosystems as sunlight, changes form and is transferred in the exchanges (production, consumption, and decomposition) that comprise food webs.

### **Strand 2.3—Humans and Their Societies**

**A) Individuals and groups—** Learners understand that how individuals perceive the environment is influenced in part by individual traits and group membership or affiliation.

- Describe individual development and identity in terms such as learning, perception, innate abilities, culture, social influences, and experience. Interpret their own beliefs about the environment using similar concepts.
- Explain how group membership—and shared values, beliefs, and assumptions—can influence individuals, impel different reactions to physical and social environments and changes, and cause social change. For example, describe how family, religion, gender, ethnicity, socioeconomic status, and other factors may influence individuals’ values and perceptions about the environment and their communities.
- Identify and critique instances of stereotyping based on group affiliation. For example, discuss how people who are all identified as “environmentalists” may have very different perspectives from one another.

**B) Culture—**As they become familiar with a wider range of cultures and subcultures, learners gain an understanding of cultural perspectives on the environment and how the environment may, in turn, influence culture.

- Explain how the environment is perceived differently by various cultures, and how these perspectives may influence individuals’ perceptions of the environment. For example, based on stories from other cultures, script and perform scenes about what is considered beautiful, valuable, or frightening in the environment.
- Explain how new technologies can change cultural perceptions and social behavior. For example, discuss how snowmobiles have changed subsistence lifestyles in Alaska, or the impact of air conditioning on settlement in southern Florida.
- Identify ways in which transportation and communications technology helps, or has helped, spread cultural values and behavior patterns.

**C) Political and economic systems**—Learners become more familiar with political and economic systems and how these systems take the environment into consideration.

- Differentiate among public and private goods and services, using environment-related goods and services to illustrate. For example, examine the values and functions of wetlands. Distinguish among public goods, such as groundwater recharge, flood control, and wildlife habitat; and private goods, such as their value for agricultural production or water storage, or the value of draining the land for other uses. Discuss difficulties encountered in drawing these distinctions.
- Identify economic and political features of the local community and state, and describe how environmental decisions can be influenced by these economic and political systems and actors.
- Identify ways in which governments and economic systems work to protect the environment and distribute natural resources. Give examples of laws, incentives, and penalties that affect people's behavior toward the environment and each other.

**D) Global connections**—Learners become familiar with ways in which the world's environmental, social, economic, cultural, and political systems are linked.

- Explain international trade in terms of uneven distribution of resources.
- Describe ways in which the global environment is affected by individual and group actions, as well as by government policies and actions having to do with energy use and other forms of consumption, waste disposal, resource management, industry, and population.
- Explain how an environmental change in one part of the world can have consequences for other places. For example, develop a map or another visual presentation that shows the effects of acid rain or nuclear fallout in places distant from the source of the pollution.
- Identify a variety of global links, including transportation and communication systems, treaties, multinational corporations, and international organizations.

**E) Change and conflict**—Learners understand that human systems change over time and that conflicts sometimes arise over differing and changing viewpoints about the environment.

- Describe patterns of change within and across cultures, communities, and other groups. Consider the rapidity of change, mechanisms that helped spread change, and what motivated change. For example, discuss how and why wastewater treatment became a common practice in the United States.
- Explain how change affects individuals and groups differently and give examples of the trade-offs involved in decisions and actions ranging from the individual to the societal levels. For example, discuss how a decision about where to site a landfill, build a chemical plant, or locate a new highway might affect different neighborhoods, businesses, workers, people of varying socio-economic status, and others. Role play their reactions.
- Describe and analyze examples of tensions between individual rights and benefits and the societal good. Illustrate with examples from the local community, possibly including disagreements over zoning, controversial proposals to raise taxes to pay for the purchase of open space or sewer system upgrades, or tradeoffs between commuting to work individually in a car or taking public transportation.
- Identify some of the formal and informal ways that groups (including governments) attempt to anticipate, avoid, or resolve conflicts related to the environment.

## **Strand 2.4—Environment and Society**

**A) Human/environment interactions**—Learners understand that human-caused changes have consequences for the immediate environment as well as for other places and future times.

- Describe intended and unintended environmental and social consequences associated with the changing use of technologies. Consider consequences that may be positive as well as negative. For example, discuss particular irrigation methods, different ways of generating electrical power, or the use of synthetic pesticides.
- Explain how human-caused environmental changes cause changes in other places. For example, discuss the effects of building a dam on downstream plant and animal communities as well as on human communities.

- Describe the effects of a local environmental restoration effort, such as wetlands creation. Predict the long-term consequences of such efforts, or a particular restoration project.

**B) Places**—Learners begin to explore the meaning of places both close to home and around the world.

- Analyze physical and human characteristics of places and make inferences about how and why these characteristics have developed and changed over time. For example, use maps and satellite photographs to examine how cities change in response to natural disasters such as floods, hurricanes, or earthquakes.
- Identify ways in which personal perceptions, culture, and technology influence people’s perceptions of places. Discuss the importance of some places (such as Yellowstone National Park or the Mississippi River) as cultural symbols.
- Identify regions based on different criteria such as watershed boundaries, sales and service areas for different businesses, or the area from which sports teams draw fans or symphony orchestras attract audiences.

**C) Resources**—Learners understand that uneven distribution of resources influences their use and perceived value.

- Map and discuss distribution and consumption patterns for specific resources, such as metals, fresh water, or certain types of forests. Note resources that are being rapidly depleted.
- Explain why certain resources (such as oil, coal, or natural gas) are key to the development of human societies, and identify resources that were critical to development at different times in history.
- Explain conflicts between individuals, states, regions, or nations noting factors such as differing attitudes about the use of specific resources and scarcity of natural resources. Illustrate with local or regional examples such as conflicts over water rights and use of habitat for local endangered species.

**D) Technology**—Learners understand the human ability to shape and control the environment as a function of the capacities for creating knowledge and developing new technologies.

- Discuss technologies in the context of larger systems that have shaped the course of human history as well as human relationships with the environment. Use illustrations from the agricultural, industrial and transportation revolutions that have dramatically changed how people live and use resources.
- Analyze how the ability to develop and use technology gives humans great influence over the environment and other living things. Use examples from their region, such as the ability to construct levees to protect areas from flooding or create wildlife refuges, build machines that produce or reduce air or water pollution, or domesticate plants or animals for food production.
- Identify some of the important environmental and social issues related to particular technological developments in fields such as agriculture, manufacturing, and energy.

**E) Environmental issues**—Learners are familiar with a range of environmental issues at scales that range from local to national to global. They understand that people in other places around the world experience issues similar to the ones they are concerned about locally.

- Identify other places, either contemporary or historical, experiencing issues similar to those in the learner’s community or region.
- Explain how issues arise because of conflicting points of view about a specific proposal, event, or condition in the environment. For example, discuss conflicting perspectives about past and present proposals to build large-scale dams such as the Three Gorges project in China, the Hetch-Hetchy dam in the U.S., or a similar project in the learner’s region.
- Discuss how the disagreements at the heart of environmental issues make them difficult to resolve. Consider the role of understanding, creativity, or compromise in finding solutions.

## **STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES**

### **Strand 3.1—Skills for Analyzing and Investigating Environmental Issues**

**A) Identifying and investigating issues**—Learners are able to use primary and secondary sources of information, and apply growing research and analytical skills, to investigate environmental issues, beginning in their own community.

- Clearly articulate and define environmental issues. For example, describe the history and origins of the issue, actions that have been taken to address the issue, the apparent effects of these actions, and the current situation.
- Identify key individuals and groups involved, their viewpoints, and the types of action they support. Describe areas of conflict and agreement.
- Investigate the issue using secondary sources and original research where needed.
- Examine how others have analyzed and understood the issue, identifying their approaches and the assumptions behind them.
- Compare the issue with similar issues from other places and times.

**B) Sorting out the consequences of issues**—Learners are able to apply their knowledge of ecological and human processes and systems to identify the consequences of specific environmental issues.

- Describe the effects of human actions on specific elements, systems, and processes of the environment.
- Analyze issues by looking at trade-offs that have been made. For example, consider where various human activities (such as landfills, highways, chemical factories, or hazardous waste incinerators) are located and their effects on different places and different segments of the population.
- Speculate about the effects of a proposed state or local environmental regulation. For example, consider effects on different sectors of the economy, neighborhoods, public health, particular plant and animal species and communities, and overall environmental quality.
- Project the consequences of inaction or failure to resolve particular issues.

**C) Identifying and evaluating alternative solutions and courses of action**—Learners are able to identify and develop action strategies for addressing particular issues.

- Identify different proposals for resolving an environmental issue. Recognize and explain the perspectives on the issue that are embedded in those views.
- Explain why various strategies may be effective in different situations. Consider their likely effects on society and the environment.
- Independently and in groups, develop original strategies to address issues.
- Discern similarities and differences in problem situations which might affect their ability to apply strategies that were successful in other places and times.

**D) Working with flexibility, creativity, and openness**—Learners are able to consider the assumptions and interpretations that influence the conclusions they and others draw about environmental issues.

- Explain how the interplay of ideas and perspectives strengthens the process of inquiry and the societal ability to address issues.
- Receive questions and alternative explanations that others offer in discussions as well as in readings.
- Explain why it is not always possible to select one correct explanation or a single best approach to addressing an issue.

### **Strand 3.2—Decision-Making and Citizenship Skills**

**A) Forming and evaluating personal views**—Learners are able to identify, justify, and clarify their views on environmental issues and alternative ways to address them.

- Discuss personal perspectives with classmates, remaining open to new ideas and information.
- Justify their views based on information from a variety of sources, and clear reasoning.

- Discuss their own beliefs and values regarding the environment and relate their personal view of environmental issues to these.
- Identify ways in which others' views correspond or differ with their own views.

**B) Evaluating the need for citizen action**—Learners are able to evaluate whether they believe action is needed in particular situations, and decide whether they should be involved.

- Discuss whether action is warranted. Account for factors such as the scale of the problem; legal, social, economic, and ecological consequences; and alternatives to citizen action.
- Identify different forms of action that citizens can take in the economic, political, and legal spheres, as well as actions aimed at directly improving or maintaining some part of the environment or persuading others to take action.
- Speculate about the likely effects of specific actions on society and the environment, and the likelihood these actions will resolve a specific environmental issue.
- Point out advantages and disadvantages of their personal involvement, considering factors such as their own skills, resources, knowledge, and commitment.

**C) Planning and taking action**—As learners begin to see themselves as citizens taking active roles in their communities, they are able to plan for and engage in citizen action at levels appropriate to their maturity and preparation.

- Develop action plans they can carry out individually, in small groups, or with a class, club, or larger organization. Include clear reasons and goals for action. Base these plans on knowledge of a range of citizen action strategies and the results of their environmental issue investigations.
- Set realistic goals for action and include measures of success consistent with learners' abilities and an understanding of the complexity of the issue.
- Decide whether their plan should be implemented immediately or at another time, changed, or abandoned; and carry through with action when appropriate.

**D) Evaluating the results of actions**—Learners are able to analyze the effects of their own actions and actions taken by other individuals and groups.

- Analyze the effects of decisions, policies, and actions taken by individuals and groups on a particular issue.
- Analyze their own actions, explaining apparent effects and discussing them in light of students' goals and reasons for acting.
- Describe some of the reasons why analyzing the results of actions may be difficult, including the scale of the issue, the time required to see effects, and the influence of other actions and factors.

## **STRAND 4—PERSONAL AND CIVIC RESPONSIBILITY**

**A) Understanding societal values and principles**—Learners understand that societal values can be both a unifying and a divisive force.

- Identify some of the shared political values and principles that unite American society, and explain their importance.
- Discuss conflicting views about the meaning and application of shared values in specific issues. For example, explore conflicting views about the idea that one person's rights end where they infringe on another's. Use a specific context such as proposed sports stadium or whether to permit an industrial facility or housing development that is likely to pollute a stream.
- Identify ways in which advocates appeal to values such as individual freedoms, property rights, the public good, economic well-being, and patriotism. For example, analyze speeches and writing on specific environmental issues.
- Evaluate the principle of stewardship as a shared societal value. For example, compare conceptions of stewardship contained in writings of John Muir, Gifford Pinchot, and Aldo Leopold with their own understanding.

**B) Recognizing citizens' rights and responsibilities**—Learners understand the rights and responsibilities of citizenship and their importance in promoting the resolution of environmental issues.

- Identify rights and responsibilities associated with citizenship, including personal and civic responsibilities.
- Describe ways in which commonly accepted rights and responsibilities of citizenship motivate people to help resolve environmental issues. Consider rights and responsibilities such as acquiring, using and selling property; the right to vote; freedom of speech and assembly; accepting responsibility for the consequences of one's actions; obeying the law; and respecting the rights and interests of others.

**C) Recognizing efficacy**—Learners possess a realistic self-confidence in their effectiveness as citizens.

- Explain the ways in which citizen action and public opinion influence environmental policy decisions.
- Describe how individuals and groups act within society to create change, meet individual needs and promote the common good. Illustrate with examples from environmental issues.
- Describe ways in which their actions have made a difference. Use examples that begin in the classroom and the home, and extend beyond to encompass the broader communities in which students begin to see possibilities for action.

**D) Accepting personal responsibility**—Learners understand that their actions can have broad consequences and that they are responsible for those consequences.

- Analyze some of the effects that their actions (and the actions of their families, social groups, and communities) have on the environment, other humans, and other living beings.
- Describe actions in terms of their effects that reach into the future.
- Describe their personal responsibilities, comparing their view of their responsibilities with commonly accepted societal views.
- Identify ways in which they feel responsible for helping resolve environmental issues within their community.

| <p><b>Key to Symbols:</b></p> <ul style="list-style-type: none"> <li>● The EE concept is the main focus of the Project WILD activity.</li> <li>⊙ The concept is one of the main focuses of the activity; is reinforced.</li> <li>○ The concept is not the main focus of the activity, but it is supported or reinforced.</li> </ul> <p><b>ENVIRONMENTAL EDUCATION GUIDELINES FOR LEARNING, 5–8</b></p> | Interview a Spider (gr. 5–8, p. 12) | Habitat Rummy (gr. 5–8, p. 14) | Bearly Growing (gr. 5–8, p. 19) | How Many Bears Can Live in This Forest (gr. 5–8, p. 23) | My Kingdom for a Shelter (gr. 5–8, p. 28) | Tracks! (gr. 5–8, p. 30) | Spider Web Geometry (gr. 5–8, p. 34) | Oh Deer! (gr. 5–8, p. 36) | Wild Words (gr. 5–8, p. 41) | Habitat Lap Sit (gr. 5–8, p. 61) | Who Fits Here? (gr. 5–8, p. 64) | Which Niche? (gr. 5–8, p. 66) | What Did Your Lunch Cost Wildlife? (gr. 5–8, p. 68) |
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| <b>STRAND 1—QUESTIONING AND ANALYSIS SKILLS</b>  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| A. Questioning   | ●                                   |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| B. Designing investigations  | ●                                   |                                |                                 |   | ○   |                          | ○                                    |                           | ○                           |                                  |                                 | ○                             | ○   |
| C. Collecting information  | ●                                   | ⊙                              | ○                               |   | ⊙   | ⊙                        | ○                                    | ○                         |                             |                                  | ⊙                               | ⊙                             | ⊙   |
| D. Evaluating accuracy and reliability   |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               | ○   |
| E. Organizing information  | ⊙                                   | ⊙                              | ⊙                               |   | ○   | ○                        |                                      | ○                         |                             |                                  | ⊙                               | ○                             | ○   |
| F. Working with models and simulations   |                                     |                                |                                 | ⊙   | ⊙   |                          | ⊙                                    | ⊙                         |                             | ⊙                                |                                 |                               |   |
| G. Developing explanations   |                                     | ○                              | ○                               | ⊙   | ○   |                          |                                      | ○                         | ○                           | ○                                | ○                               | ○                             | ⊙   |
| <b>STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS</b>   |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| <b>2.1—The Earth as a Physical System</b>  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| A. Processes that shape the Earth  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| B. Changes in matter   |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| C. Energy  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               | ○   |
| <b>2.2—The Living Environment</b>  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| A. Organisms, populations, and communities   | ○                                   | ●                              | ○                               | ●   | ○   | ○                        |                                      | ●                         |                             | ⊙                                | ●                               | ●                             | ○   |
| B. Heredity and evolution  | ○                                   |                                | ⊙                               | ⊙   |   |                          |                                      | ○                         |                             |                                  |                                 | ⊙                             |   |
| C. Systems and connections   |                                     | ●                              |                                 | ⊙   |   |                          |                                      | ●                         |                             | ○                                | ●                               | ●                             |   |
| D. Flow of matter and energy   |                                     | ⊙                              |                                 |   |   |                          |                                      | ⊙                         |                             | ○                                | ○                               | ⊙                             | ○   |
| <b>2.3—Humans and Their Societies</b>  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| A. Individuals and groups  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| B. Culture   |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| C. Political and economic systems  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| D. Global connections  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               | ○   |
| E. Change and conflict   |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| <b>2.4—Environment and Society</b>   |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| A. Human/environment interactions  |                                     |                                |                                 | ○   |   |                          |                                      |                           |                             |                                  |                                 |                               | ○   |
| B. Places  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| C. Resources   |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               | ○   |
| D. Technology  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| E. Environmental issues  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |

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| <b>STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES</b>   |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| <b>3.1—Skills for Analyzing and Investigating Environmental Issues</b>   |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| A. Identifying and investigating issues  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               | ○   |
| B. Sorting out the consequences of issues  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               | ○   |
| C. Identifying and evaluating alternative solutions and courses of action  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               | ○   |
| D. Working with flexibility, creativity, and openness  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               | ○   |
| <b>3.2—Decision-Making and Citizenship Skills</b>  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| A. Forming and evaluating personal views   |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               | ○   |
| B. Evaluating the need for citizen action  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| C. Planning and taking action  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| D. Evaluating the results of actions   |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               | ○   |
| <b>STRAND 4—PERSONAL AND CIVIC RESPONSIBILITY</b>  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| A. Understanding societal values and principles  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| B. Recognizing citizens’ rights and responsibilities   |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| C. Recognizing efficacy  |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               |   |
| D. Accepting personal responsibility   |                                     |                                |                                 |   |   |                          |                                      |                           |                             |                                  |                                 |                               | ○   |

| <p><b>Key to Symbols:</b></p> <ul style="list-style-type: none"> <li>● The EE concept is the main focus of the Project WILD activity.</li> <li>⊙ The concept is one of the main focuses of the activity; is reinforced.</li> <li>○ The concept is not the main focus of the activity, but it is supported or reinforced.</li> </ul> <p><b>ENVIRONMENTAL EDUCATION GUIDELINES FOR LEARNING, 5–8</b></p> | Urban Nature Search (gr. 5–8, p. 70) | Rainfall and the Forest (gr. 5–8, p. 73) | Microtrek Treasure Hunt (gr. 5–8, p. 82) | Stormy Weather (gr. 5–8, p. 85) | Ants on a Twig (gr. 5–8, p. 88) | Good Buddies (gr. 5–8, p. 91) | What’s for Dinner? (gr. 5–8, p. 96) | Seed Need (gr. 5–8, p. 98) | Owl Pellets (gr. 5–8, p. 100) | Eco-Enrichers (gr. 5–8, p. 102) | Energy Pipeline (gr. 7–8, p. 105) | Quick-Frozen Critters (gr. 5–8, p. 122) | Polar Bears in Phoenix? (gr. 5–8, p. 125) |
|--|--------------------------------------|--|--|---------------------------------|---------------------------------|-------------------------------|-------------------------------------|----------------------------|-------------------------------|---------------------------------|-----------------------------------|---|---|
| <b>STRAND 1—QUESTIONING AND ANALYSIS SKILLS</b>  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| A. Questioning   |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| B. Designing investigations  |                                      |  |  |                                 | ○                               |                               | ○                                   |                            | ○                             | ○                               |                                   | ○                                       | ○   |
| C. Collecting information  | ⊙                                    | ⊙  | ⊙  |                                 | ⊙                               | ○                             | ○                                   | ○                          | ⊙                             | ⊙                               | ⊙                                 | ⊙                                       | ⊙   |
| D. Evaluating accuracy and reliability   |                                      |  |  |                                 |                                 |                               |                                     |                            | ○                             |                                 |                                   |   |   |
| E. Organizing information  | ○                                    | ●  |  |                                 | ⊙                               |                               | ⊙                                   | ○                          | ○                             | ⊙                               | ⊙                                 | ⊙                                       | ⊙   |
| F. Working with models and simulations   |                                      | ⊙  |  | ⊙                               | ○                               | ○                             |                                     | ○                          |                               |                                 | ●                                 | ●                                       | ⊙   |
| G. Developing explanations   | ○                                    | ⊙  | ○  |                                 | ⊙                               | ○                             | ○                                   | ○                          | ○                             | ⊙                               | ⊙                                 | ⊙                                       | ⊙   |
| <b>STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS</b>   |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| <b>2.1—The Earth as a Physical System</b>  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| A. Processes that shape the Earth  |                                      | ○  |  | ○                               |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| B. Changes in matter   |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| C. Energy  |                                      |  |  |                                 |                                 |                               | ⊙                                   |                            |                               |                                 | ●                                 |   |   |
| <b>2.2—The Living Environment</b>  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| A. Organisms, populations, and communities   | ⊙                                    | ⊙  | ○  |                                 | ⊙                               | ○                             | ○                                   | ○                          | ○                             | ○                               | ⊙                                 |   | ○   |
| B. Heredity and evolution  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| C. Systems and connections   | ○                                    | ⊙  | ○  |                                 | ○                               | ⊙                             | ○                                   | ○                          | ⊙                             | ⊙                               | ⊙                                 | ⊙                                       | ○   |
| D. Flow of matter and energy   | ○                                    |  |  |                                 |                                 |                               | ●                                   | ○                          | ⊙                             | ○                               | ●                                 | ○                                       |   |
| <b>2.3—Humans and Their Societies</b>  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| A. Individuals and groups  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| B. Culture   |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| C. Political and economic systems  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| D. Global connections  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 | ○                                 |   |   |
| E. Change and conflict   |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| <b>2.4—Environment and Society</b>   |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| A. Human/environment interactions  | ○                                    | ○  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   | ○   |
| B. Places  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| C. Resources   |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 | ○                                 |   |   |
| D. Technology  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| E. Environmental issues  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |

| <p><b>Key to Symbols:</b></p> <ul style="list-style-type: none"> <li>● The EE concept is the main focus of the Project WILD activity.</li> <li>◎ The concept is one of the main focuses of the activity; is reinforced.</li> <li>○ The concept is not the main focus of the activity, but it is supported or reinforced.</li> </ul> <p><b>ENVIRONMENTAL EDUCATION GUIDELINES FOR LEARNING, 5–8</b></p> | Urban Nature Search (gr. 5–8, p. 70) | Rainfall and the Forest (gr. 5–8, p. 73) | Microtrek Treasure Hunt (gr. 5–8, p. 82) | Stormy Weather (gr. 5–8, p. 85) | Ants on a Twig (gr. 5–8, p. 88) | Good Buddies (gr. 5–8, p. 91) | What's for Dinner? (gr. 5–8, p. 96) | Seed Need (gr. 5–8, p. 98) | Owl Pellets (gr. 5–8, p. 100) | Eco-Enrichers (gr. 5–8, p. 102) | Energy Pipeline (gr. 7–8, p. 105) | Quick-Frozen Critters (gr. 5–8, p. 122) | Polar Bears in Phoenix? (gr. 5–8, p. 125) |
|--|--------------------------------------|--|--|---------------------------------|---------------------------------|-------------------------------|-------------------------------------|----------------------------|-------------------------------|---------------------------------|-----------------------------------|---|---|
| <b>STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES</b>   |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| <b>3.1—Skills for Analyzing and Investigating Environmental Issues</b>   |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| A. Identifying and investigating issues  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| B. Sorting out the consequences of issues  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| C. Identifying and evaluating alternative solutions and courses of action  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| D. Working with flexibility, creativity, and openness  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| <b>3.2—Decision-Making and Citizenship Skills</b>  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| A. Forming and evaluating personal views   |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 | ○                                 |   |   |
| B. Evaluating the need for citizen action  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| C. Planning and taking action  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| D. Evaluating the results of actions   |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| <b>STRAND 4—PERSONAL AND CIVIC RESPONSIBILITY</b>  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| A. Understanding societal values and principles  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| B. Recognizing citizens' rights and responsibilities   |                                      |  |  |                                 |                                 |                               |                                     |                            |                               |                                 |                                   |   |   |
| C. Recognizing efficacy  |                                      |  |  |                                 |                                 |                               |                                     |                            |                               | ○                               | ○                                 |   |   |
| D. Accepting personal responsibility   |                                      |  |  |                                 |                                 |                               |                                     |                            |                               | ○                               | ○                                 |   |   |

| <p><b>Key to Symbols:</b></p> <ul style="list-style-type: none"> <li>● The EE concept is the main focus of the Project WILD activity.</li> <li>⊙ The concept is one of the main focuses of the activity; is reinforced.</li> <li>○ The concept is not the main focus of the activity, but it is supported or reinforced.</li> </ul> <p><b>ENVIRONMENTAL EDUCATION GUIDELINES FOR LEARNING, 5–8</b></p> | Adaptation Artistry (gr. 5–8, p. 128) | MuskoX Maneuvers (gr. 5–8, p. 130) | I'm Thirsty (gr. 6–8, p. 134) | Move Over Rover (gr. 5–6, p. 144) | Planting Animals (gr. 5–8, p. 152) | Here Today, Gone Tomorrow (gr. 5–8, p. 154) | Time Lapse (gr. 5–8, p. 158) | Ecosystem Facelift (gr. 7–8, p. 166) | Museum Search for Wildlife (gr. 5–8, p. 182) | Saturday Morning Wildlife Watching (gr. 5–8, p. 184) | Wildlife in National Symbols (gr. 5–8, p. 186) | Prairie Memoirs (gr. 5–8, p. 188) | Cartoons and Bumper Stickers (gr. 5–8, p. 192) |
|--|---------------------------------------|------------------------------------|-------------------------------|-----------------------------------|------------------------------------|---|------------------------------|--------------------------------------|--|--|--|-----------------------------------|--|
| <b>STRAND 1—QUESTIONING AND ANALYSIS SKILLS</b>  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| A. Questioning   |                                       |                                    | ●                             |                                   | ⊙                                  | ○   |                              |                                      |  |  | ○  |                                   |  |
| B. Designing investigations  |                                       |                                    |                               |                                   | ○                                  | ○   |                              |                                      |  |  |  |                                   |  |
| C. Collecting information  |                                       | ○                                  | ○                             | ⊙                                 | ⊙                                  | ⊙   | ●                            | ○                                    |  |  | ○  | ⊙                                 | ○  |
| D. Evaluating accuracy and reliability   |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  | ○  |  |                                   |  |
| E. Organizing information  | ○                                     | ○                                  | ⊙                             | ⊙                                 | ⊙                                  | ●   | ●                            | ○                                    |  |  |  |                                   |  |
| F. Working with models and simulations   | ○                                     | ●                                  | ○                             | ●                                 | ⊙                                  |   | ⊙                            | ●                                    |  |  |  |                                   |  |
| G. Developing explanations   | ○                                     | ⊙                                  | ⊙                             | ⊙                                 | ⊙                                  | ⊙   | ●                            | ⊙                                    |  |  |  |                                   |  |
| <b>STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS</b>   |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| <b>2.1—The Earth as a Physical System</b>  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| A. Processes that shape the Earth  |                                       |                                    |                               |                                   |                                    |   |                              | ⊙                                    |  |  |  |                                   |  |
| B. Changes in matter   |                                       |                                    |                               |                                   |                                    |   |                              | ○                                    |  |  |  |                                   |  |
| C. Energy  |                                       |                                    |                               |                                   |                                    |   |                              | ○                                    |  |  |  |                                   |  |
| <b>2.2—The Living Environment</b>  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| A. Organisms, populations, and communities   | ●                                     | ●                                  | ⊙                             | ●                                 | ○                                  |   |                              | ⊙                                    |  |  |  |                                   |  |
| B. Heredity and evolution  | ⊙                                     | ○                                  | ●                             | ⊙                                 |                                    | ●   | ○                            |                                      |  |  |  |                                   |  |
| C. Systems and connections   |                                       | ●                                  | ○                             | ●                                 | ○                                  | ○   | ○                            | ⊙                                    |  |  |  |                                   |  |
| D. Flow of matter and energy   |                                       |                                    | ○                             | ○                                 |                                    |   |                              | ○                                    |  |  |  |                                   |  |
| <b>2.3—Humans and Their Societies</b>  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| A. Individuals and groups  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   | ○  |
| B. Culture   |                                       |                                    |                               |                                   |                                    |   |                              |                                      | ○  |  | ○  | ●                                 | ○  |
| C. Political and economic systems  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| D. Global connections  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| E. Change and conflict   |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| <b>2.4—Environment and Society</b>   |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| A. Human/environment interactions  |                                       |                                    | ○                             |                                   | ○                                  | ○   | ○                            | ○                                    |  |  |  |                                   |  |
| B. Places  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| C. Resources   |                                       |                                    | ○                             |                                   |                                    | ○   |                              |                                      |  |  |  |                                   |  |
| D. Technology  |                                       |                                    |                               |                                   |                                    |   |                              | ○                                    |  |  |  |                                   |  |
| E. Environmental issues  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |

| <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>Key to Symbols:</b> <ul style="list-style-type: none"> <li>● The EE concept is the main focus of the Project WILD activity.</li> <li>⊙ The concept is one of the main focuses of the activity; is reinforced.</li> <li>○ The concept is not the main focus of the activity, but it is supported or reinforced.</li> </ul> </div> <b>ENVIRONMENTAL EDUCATION GUIDELINES FOR LEARNING, 5–8</b> | Adaptation Artistry (gr. 5–8, p. 128) | Muskox Maneuvers (gr. 5–8, p. 130) | I’m Thirsty (gr. 6–8, p. 134) | Move Over Rover (gr. 5–6, p. 144) | Planting Animals (gr. 5–8, p. 152) | Here Today, Gone Tomorrow (gr. 5–8, p. 154) | Time Lapse (gr. 5–8, p. 158) | Ecosystem Facelift (gr. 7–8, p. 166) | Museum Search for Wildlife (gr. 5–8, p. 182) | Saturday Morning Wildlife Watching (gr. 5–8, p. 184) | Wildlife in National Symbols (gr. 5–8, p. 186) | Prairie Memoirs (gr. 5–8, p. 188) | Cartoons and Bumper Stickers (gr. 5–8, p. 192) |
|--|---------------------------------------|------------------------------------|-------------------------------|-----------------------------------|------------------------------------|---|------------------------------|--------------------------------------|--|--|--|-----------------------------------|--|
| <b>STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES</b>   |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| <b>3.1—Skills for Analyzing and Investigating Environmental Issues</b>   |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| A. Identifying and investigating issues  |                                       |                                    |                               |                                   | ○                                  |   |                              |                                      |  |  |  |                                   |  |
| B. Sorting out the consequences of issues  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| C. Identifying and evaluating alternative solutions and courses of action  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| D. Working with flexibility, creativity, and openness  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   | ○  |
| <b>3.2—Decision-Making and Citizenship Skills</b>  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| A. Forming and evaluating personal views   |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   | ○  |
| B. Evaluating the need for citizen action  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| C. Planning and taking action  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| D. Evaluating the results of actions   |                                       |                                    |                               |                                   | ○                                  |   |                              |                                      |  |  |  |                                   |  |
| <b>STRAND 4—PERSONAL AND CIVIC RESPONSIBILITY</b>  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| A. Understanding societal values and principles  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   | ⊙  |
| B. Recognizing citizens’ rights and responsibilities   |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| C. Recognizing efficacy  |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |
| D. Accepting personal responsibility   |                                       |                                    |                               |                                   |                                    |   |                              |                                      |  |  |  |                                   |  |

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|--|-----------------------------------|--------------------------------------|----------------------------------|---|---------------------------------------|-------------------------------|---|-------------------------------------|---|--------------------------------------|--------------------------------------|--|---------------------------------|
| <b>STRAND 1—QUESTIONING AND ANALYSIS SKILLS</b>  |                                   |                                      |                                  |   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |
| A. Questioning   |                                   |                                      |                                  |   |                                       |                               |   |                                     |   | ⊙                                    |                                      |  |                                 |
| B. Designing investigations  |                                   |                                      |                                  |   |                                       |                               |   |                                     |   | ⊙                                    |                                      |  |                                 |
| C. Collecting information  |                                   |                                      | ○                                | ○   |                                       |                               |   | ○                                   | ⊙                                       |                                      | ○                                    | ○  |                                 |
| D. Evaluating accuracy and reliability   |                                   |                                      |                                  |   | ●                                     |                               |   |                                     |   |                                      |                                      |  |                                 |
| E. Organizing information  |                                   |                                      |                                  | ○   |                                       |                               | ○   |                                     | ○                                       |                                      |                                      |  |                                 |
| F. Working with models and simulations   |                                   |                                      |                                  |   |                                       | ⊙                             |   | ○                                   |   |                                      | ○                                    |  |                                 |
| G. Developing explanations   |                                   |                                      |                                  | ○   |                                       |                               | ○   |                                     | ○                                       |                                      | ○                                    |  |                                 |
| <b>STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS</b>   |                                   |                                      |                                  |   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |
| <b>2.1—The Earth as a Physical System</b>  |                                   |                                      |                                  |   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |
| A. Processes that shape the Earth  |                                   |                                      |                                  |   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |
| B. Changes in matter   |                                   |                                      |                                  |   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |
| C. Energy  |                                   |                                      |                                  |   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |
| <b>2.2—The Living Environment</b>  |                                   |                                      |                                  |   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |
| A. Organisms, populations, and communities   |                                   |                                      |                                  |   |                                       |                               | ○   | ○                                   |   |                                      |                                      |  |                                 |
| B. Heredity and evolution  |                                   |                                      |                                  |   |                                       |                               |   | ○                                   |   |                                      |                                      |  |                                 |
| C. Systems and connections   |                                   |                                      |                                  |   |                                       |                               |   | ○                                   | ⊙                                       |                                      |                                      |  |                                 |
| D. Flow of matter and energy   |                                   |                                      |                                  |   |                                       |                               |   | ⊙                                   |   |                                      |                                      |  |                                 |
| <b>2.3—Humans and Their Societies</b>  |                                   |                                      |                                  |   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |
| A. Individuals and groups  | ○                                 | ●                                    | ○                                |   | ○                                     |                               |   | ○                                   |   | ○                                    | ⊙                                    |  | ○                               |
| B. Culture   | ○                                 | ⊙                                    | ○                                |   | ○                                     |                               |   | ○                                   |   | ○                                    | ⊙                                    |  | ○                               |
| C. Political and economic systems  |                                   | ⊙                                    |                                  |   |                                       | ●                             |   | ○                                   | ○                                       |                                      |                                      |  |                                 |
| D. Global connections  |                                   | ⊙                                    |                                  |   |                                       |                               |   |                                     | ○                                       |                                      |                                      |  |                                 |
| E. Change and conflict   |                                   | ○                                    | ○                                |   |                                       |                               |   |                                     |   |                                      | ○                                    |  |                                 |
| <b>2.4—Environment and Society</b>   |                                   |                                      |                                  |   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |
| A. Human/environment interactions  |                                   |                                      |                                  |   |                                       | ⊙                             |   | ⊙                                   | ⊙                                       |                                      | ○                                    | ⊙  |                                 |
| B. Places  |                                   | ●                                    |                                  |   |                                       | ○                             |   |                                     | ○                                       |                                      | ○                                    |  |                                 |
| C. Resources   |                                   | ○                                    |                                  | ⊙   |                                       | ⊙                             |   | ○                                   | ○                                       |                                      | ○                                    |  |                                 |
| D. Technology  |                                   |                                      |                                  |   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |
| E. Environmental issues  |                                   | ○                                    | ⊙                                |   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |

| <p><b>Key to Symbols:</b></p> <ul style="list-style-type: none"> <li>● The EE concept is the main focus of the Project WILD activity.</li> <li>⊙ The concept is one of the main focuses of the activity; is reinforced.</li> <li>○ The concept is not the main focus of the activity, but it is supported or reinforced.</li> </ul> <p><b>ENVIRONMENTAL EDUCATION GUIDELINES FOR LEARNING, 5–8</b></p> | Power of a Song (gr. 5–8, p. 194) | For Your Eyes Only (gr. 5–8, p. 197) | Ethi-Reasoning (gr. 5–8, p. 203) | What You Wear is What They Were (gr. 5–8, p. 210) | Does Wildlife Sell? (gr. 5–8, p. 213) | Pay to Play (gr. 5–8, p. 216) | Lobster in Your Lunch Box (gr. 5–8, p. 245) | Let's Talk Turkey (gr. 5–8, p. 248) | Wildlife Bibliography (gr. 5–8, p. 253) | Changing Attitudes (gr. 5–8, p. 255) | Changing Societies (gr. 7–8, p. 258) | History of Wildlife Management (gr. 5–8, p. 267) | Animal Poetry (gr. 5–8, p. 282) |
|--|-----------------------------------|--------------------------------------|----------------------------------|---|---------------------------------------|-------------------------------|---|-------------------------------------|---|--------------------------------------|--------------------------------------|--|---------------------------------|
| <b>STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES</b>   |                                   |                                      |                                  |   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |
| <b>3.1—Skills for Analyzing and Investigating Environmental Issues</b>   |                                   |                                      |                                  |   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |
| A. Identifying and investigating issues  |                                   | ○                                    |                                  |   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |
| B. Sorting out the consequences of issues  |                                   | ○                                    | ⊙                                | ○   |                                       | ○                             |   |                                     | ○                                       |                                      |                                      |  |                                 |
| C. Identifying and evaluating alternative solutions and courses of action  |                                   | ○                                    | ⊙                                | ○   |                                       | ○                             |   |                                     |   |                                      |                                      |  |                                 |
| D. Working with flexibility, creativity, and openness  |                                   | ○                                    | ●                                | ⊙   | ○                                     | ○                             |   |                                     |   | ○                                    |                                      |  |                                 |
| <b>3.2—Decision-Making and Citizenship Skills</b>  |                                   |                                      |                                  |   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |
| A. Forming and evaluating personal views   | ○                                 | ⊙                                    | ●                                | ⊙   | ○                                     |                               |   |                                     | ○                                       | ⊙                                    |                                      |  | ○                               |
| B. Evaluating the need for citizen action  |                                   |                                      | ○                                | ○   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |
| C. Planning and taking action  |                                   |                                      |                                  |   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |
| D. Evaluating the results of actions   |                                   |                                      |                                  | ○   |                                       | ○                             |   |                                     |   |                                      |                                      |  |                                 |
| <b>STRAND 4—PERSONAL AND CIVIC RESPONSIBILITY</b>  |                                   |                                      |                                  |   |                                       |                               |   |                                     |   |                                      |                                      |  |                                 |
| A. Understanding societal values and principles  | ○                                 | ⊙                                    | ⊙                                |   | ○                                     | ○                             |   |                                     | ○                                       | ○                                    | ○                                    | ○  |                                 |
| B. Recognizing citizens' rights and responsibilities   |                                   |                                      |                                  |   |                                       | ○                             |   |                                     |   |                                      |                                      |  |                                 |
| C. Recognizing efficacy  |                                   |                                      | ⊙                                | ○   |                                       | ○                             |   |                                     |   |                                      |                                      |  |                                 |
| D. Accepting personal responsibility   |                                   |                                      | ⊙                                |   |                                       | ○                             | ○   |                                     |   |                                      |                                      |  |                                 |

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|--|-------------------------------------|------------------------------|--|--------------------------------------|-------------------------------------|---|-----------------------------------|--|--|---|-----------------------------------|---|-----------------------------------|
| <b>STRAND 1—QUESTIONING AND ANALYSIS SKILLS</b>  |                                     |                              |  |                                      |                                     |   |                                   |  |  |   |                                   |   |                                   |
| A. Questioning   |                                     |                              |  |                                      |                                     |   |                                   |  |  |   |                                   |   |                                   |
| B. Designing investigations  |                                     |                              |  |                                      |                                     |   |                                   |  |  |   |                                   |   |                                   |
| C. Collecting information  |                                     |                              |  |                                      |                                     | ○                                       | ○                                 |  |  |   | ○                                 |   |                                   |
| D. Evaluating accuracy and reliability   |                                     |                              |  |                                      |                                     |   |                                   |  |  |   |                                   |   |                                   |
| E. Organizing information  |                                     |                              |  |                                      |                                     |   |                                   |  |  |   |                                   |   |                                   |
| F. Working with models and simulations   |                                     |                              | ○  | ○                                    | ○                                   |   |                                   |  |  | ○   |                                   |   |                                   |
| G. Developing explanations   |                                     |                              |  | ○                                    | ○                                   |   |                                   |  |  | ○   |                                   |   |                                   |
| <b>STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS</b>   |                                     |                              |  |                                      |                                     |   |                                   |  |  |   |                                   |   |                                   |
| <b>2.1—The Earth as a Physical System</b>  |                                     |                              |  |                                      |                                     |   |                                   |  |  |   |                                   |   |                                   |
| A. Processes that shape the Earth  |                                     |                              |  |                                      |                                     |   |                                   |  |  |   |                                   |   |                                   |
| B. Changes in matter   |                                     |                              |  |                                      |                                     |   |                                   |  |  |   |                                   |   |                                   |
| C. Energy  |                                     |                              |  |                                      |                                     |   |                                   | ●  |  |   |                                   |   |                                   |
| <b>2.2—The Living Environment</b>  |                                     |                              |  |                                      |                                     |   |                                   |  |  |   |                                   |   |                                   |
| A. Organisms, populations, and communities   |                                     |                              |  |                                      |                                     |   |                                   |  |  |   | ○                                 |   |                                   |
| B. Heredity and evolution  |                                     |                              |  |                                      |                                     |   |                                   |  |  |   |                                   |   |                                   |
| C. Systems and connections   |                                     |                              |  |                                      |                                     |   |                                   |  |  |   | ○                                 |   |                                   |
| D. Flow of matter and energy   |                                     |                              |  |                                      |                                     |   |                                   |  |  |   |                                   |   |                                   |
| <b>2.3—Humans and Their Societies</b>  |                                     |                              |  |                                      |                                     |   |                                   |  |  |   |                                   |   |                                   |
| A. Individuals and groups  |                                     | ○                            |  |                                      |                                     |   |                                   |  |  |   |                                   |   |                                   |
| B. Culture   |                                     | ○                            |  |                                      |                                     |   |                                   |  |  |   |                                   |   |                                   |
| C. Political and economic systems  |                                     |                              |  |                                      |                                     |   |                                   |  | ⊙  |   |                                   |   |                                   |
| D. Global connections  |                                     |                              |  |                                      |                                     |   |                                   |  |  |   |                                   |   |                                   |
| E. Change and conflict   |                                     |                              |  |                                      |                                     |   |                                   |  | ○  |   |                                   |   |                                   |
| <b>2.4—Environment and Society</b>   |                                     |                              |  |                                      |                                     |   |                                   |  |  |   |                                   |   |                                   |
| A. Human/environment interactions  |                                     |                              | ○  | ●                                    | ●                                   | ○                                       | ○                                 |  | ⊙  | ⊙   | ⊙                                 | ○   | ○                                 |
| B. Places  |                                     |                              |  | ○                                    |                                     |   |                                   |  |  |   | ○                                 |   |                                   |
| C. Resources   |                                     |                              |  | ○                                    | ○                                   |   |                                   | ⊙  |  |   | ○                                 |   |                                   |
| D. Technology  |                                     |                              |  |                                      | ○                                   |   |                                   | ○  | ○  |   |                                   |   |                                   |
| E. Environmental issues  |                                     |                              |  | ○                                    | ○                                   |   |                                   | ○  | ○  | ○   | ○                                 |   |                                   |

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|--|-------------------------------------|------------------------------|--|--------------------------------------|-------------------------------------|--|-----------------------------------|--|--|---|-----------------------------------|---|-----------------------------------|
| <b>STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES</b>   |                                     |                              |  |                                      |                                     |  |                                   |  |  |   |                                   |   |                                   |
| <b>3.1—Skills for Analyzing and Investigating Environmental Issues</b>   |                                     |                              |  |                                      |                                     |  |                                   |  |  |   |                                   |   |                                   |
| A. Identifying and investigating issues  |                                     |                              | ○  | ○                                    | ○                                   | ○  | ○                                 | ○  | ○  | ○   | ○                                 | ○   | ○                                 |
| B. Sorting out the consequences of issues  |                                     |                              | ○  | ⊙                                    | ○                                   | ○  | ○                                 | ○  | ○  | ○   | ○                                 | ○   | ○                                 |
| C. Identifying and evaluating alternative solutions and courses of action  |                                     |                              | ○  |                                      | ○                                   |  |                                   | ○  | ○  | ○   | ○                                 | ○   | ○                                 |
| D. Working with flexibility, creativity, and openness  |                                     |                              | ○  |                                      | ○                                   |  |                                   | ○  | ○  | ○   | ○                                 | ○   | ○                                 |
| <b>3.2—Decision-Making and Citizenship Skills</b>  |                                     |                              |  |                                      |                                     |  |                                   |  |  |   |                                   |   |                                   |
| A. Forming and evaluating personal views   | ●                                   |                              | ○  |                                      | ○                                   | ○  | ○                                 | ○  | ○  | ○   | ○                                 | ○   | ○                                 |
| B. Evaluating the need for citizen action  | ⊙                                   |                              | ○  |                                      |                                     |  | ○                                 | ○  | ○  | ○   |                                   | ○   | ○                                 |
| C. Planning and taking action  | ○                                   |                              |  |                                      |                                     |  |                                   |  |  |   |                                   |   | ○                                 |
| D. Evaluating the results of actions   | ○                                   |                              |  |                                      |                                     |  |                                   |  |  |   |                                   |   | ○                                 |
| <b>STRAND 4—PERSONAL AND CIVIC RESPONSIBILITY</b>  |                                     |                              |  |                                      |                                     |  |                                   |  |  |   |                                   |   |                                   |
| A. Understanding societal values and principles  | ⊙                                   |                              |  |                                      | ○                                   |  |                                   | ○  | ○  | ○   |                                   | ○   | ○                                 |
| B. Recognizing citizens’ rights and responsibilities   | ⊙                                   |                              |  |                                      | ○                                   |  |                                   | ○  | ○  | ○   |                                   | ○   | ○                                 |
| C. Recognizing efficacy  | ⊙                                   |                              |  |                                      | ○                                   |  |                                   | ○  | ○  | ○   |                                   | ○   | ○                                 |
| D. Accepting personal responsibility   | ⊙                                   |                              |  |                                      | ○                                   |  |                                   | ○  | ○  | ○   |                                   | ○   | ○                                 |

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| <b>STRAND 1—QUESTIONING AND ANALYSIS SKILLS</b>  |                                    |  |                                      |                            |  |                                     |   |  |                                    |  |  |  |  |
| A. Questioning   | ○                                  | ○                                      |                                      |                            |  |                                     |   |  |                                    |  |  |  |  |
| B. Designing investigations  |                                    |  |                                      |                            |  |                                     |   |  |                                    |  |  |  |  |
| C. Collecting information  | ○                                  | ○                                      |                                      |                            |  | ○                                   |   |  |                                    |  |  |  |  |
| D. Evaluating accuracy and reliability   |                                    |  |                                      |                            |  |                                     |   |  |                                    |  |  |  |  |
| E. Organizing information  | ○                                  | ⊙                                      | ○                                    | ○                          |  |                                     |   |  |                                    |  |  |  |  |
| F. Working with models and simulations   | ○                                  | ⊙                                      | ○                                    |                            | ○  |                                     | ⊙   |  |                                    |  |  |  |  |
| G. Developing explanations   | ○                                  | ⊙                                      | ○                                    |                            |  | ○                                   | ○   |  |                                    |  |  |  |  |
| <b>STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS</b>   |                                    |  |                                      |                            |  |                                     |   |  |                                    |  |  |  |  |
| <b>2.1—The Earth as a Physical System</b>  |                                    |  |                                      |                            |  |                                     |   |  |                                    |  |  |  |  |
| A. Processes that shape the Earth  |                                    |  |                                      |                            |  |                                     |   |  |                                    |  |  |  |  |
| B. Changes in matter   |                                    |  |                                      |                            |  |                                     |   |  |                                    |  |  |  |  |
| C. Energy  |                                    |  |                                      |                            |  |                                     |   |  |                                    |  |  |  |  |
| <b>2.2—The Living Environment</b>  |                                    |  |                                      |                            |  |                                     |   |  |                                    |  |  |  |  |
| A. Organisms, populations, and communities   | ○                                  | ○                                      | ○                                    |                            | ○  |                                     | ○   | ○  |                                    |  |  |  |  |
| B. Heredity and evolution  |                                    |  |                                      |                            |  |                                     |   |  |                                    |  |  |  |  |
| C. Systems and connections   | ○                                  | ○                                      | ○                                    |                            | ○  |                                     | ○   | ○  |                                    |  |  |  |  |
| D. Flow of matter and energy   |                                    |  |                                      |                            | ○  |                                     | ○   |  |                                    |  |  |  |  |
| <b>2.3—Humans and Their Societies</b>  |                                    |  |                                      |                            |  |                                     |   |  |                                    |  |  |  |  |
| A. Individuals and groups  |                                    |  |                                      |                            |  |                                     |   |  |                                    |  |  |  |  |
| B. Culture   |                                    |  |                                      |                            |  |                                     |   |  |                                    |  |  |  |  |
| C. Political and economic systems  | ⊙                                  | ○                                      |                                      |                            | ○  |                                     | ○   |  |                                    |  |  |  |  |
| D. Global connections  |                                    |  |                                      |                            |  |                                     |   |  |                                    |  |  |  |  |
| E. Change and conflict   | ○                                  | ○                                      |                                      |                            |  |                                     | ○   |  |                                    |  |  |  |  |
| <b>2.4—Environment and Society</b>   |                                    |  |                                      |                            |  |                                     |   |  |                                    |  |  |  |  |
| A. Human/environment interactions  | ○                                  | ⊙                                      | ○                                    |                            | ○  | ○                                   | ○   | ○  | ⊙                                  |  |  |  |  |
| B. Places  |                                    | ○                                      |                                      |                            |  |                                     | ○   |  |                                    |  |  |  |  |
| C. Resources   | ○                                  | ○                                      |                                      |                            | ○  |                                     | ○   |  |                                    |  |  |  |  |
| D. Technology  |                                    | ○                                      |                                      |                            |  |                                     | ○   |  |                                    |  |  |  |  |
| E. Environmental issues  | ○                                  | ⊙                                      | ○                                    |                            |  |                                     | ○   |  | ⊙                                  |  |  |  |  |

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| <b>STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES</b>  |                                    |  |                                      |                            |  |                                     |   |   |                                    |  |  |  |  |
| <b>3.1—Skills for Analyzing and Investigating Environmental Issues</b>  |                                    |  |                                      |                            |  |                                     |   |   |                                    |  |  |  |  |
| A. Identifying and investigating issues   | ○                                  | ○                                      | ○                                    |                            | ⊙  | ○                                   | ○   |   | ⊙                                  |  |  |  |  |
| B. Sorting out the consequences of issues   | ○                                  | ○                                      | ○                                    |                            | ⊙  | ○                                   | ○   | ○   | ⊙                                  |  |  |  |  |
| C. Identifying and evaluating alternative solutions and courses of action   | ○                                  | ○                                      |                                      |                            | ⊙  | ○                                   | ○   | ⊙   | ⊙                                  |  |  |  |  |
| D. Working with flexibility, creativity, and openness   | ○                                  | ○                                      |                                      |                            | ⊙  | ○                                   | ○   | ⊙   | ⊙                                  |  |  |  |  |
| <b>3.2—Decision-Making and Citizenship Skills</b>   |                                    |  |                                      |                            |  |                                     |   |   |                                    |  |  |  |  |
| A. Forming and evaluating personal views  | ○                                  | ○                                      |                                      |                            |  | ○                                   | ○   |   | ●                                  |  |  |  |  |
| B. Evaluating the need for citizen action   | ○                                  | ○                                      |                                      |                            |  | ○                                   |   | ⊙   |                                    |  |  |  |  |
| C. Planning and taking action   | ○                                  | ○                                      |                                      |                            |  | ○                                   |   | ●   |                                    |  |  |  |  |
| D. Evaluating the results of actions  | ○                                  | ○                                      |                                      |                            |  | ○                                   |   | ⊙   |                                    |  |  |  |  |
| <b>STRAND 4—PERSONAL AND CIVIC RESPONSIBILITY</b>   |                                    |  |                                      |                            |  |                                     |   |   |                                    |  |  |  |  |
| A. Understanding societal values and principles   | ○                                  | ○                                      |                                      |                            |  | ○                                   | ○   |   | ●                                  |  |  |  |  |
| B. Recognizing citizens’ rights and responsibilities  | ○                                  | ○                                      |                                      |                            |  | ○                                   | ○   | ○   | ●                                  |  |  |  |  |
| C. Recognizing efficacy   | ○                                  | ○                                      |                                      |                            |  | ○                                   | ○   | ⊙   | ●                                  |  |  |  |  |
| D. Accepting personal responsibility  | ○                                  | ○                                      |                                      |                            |  | ○                                   | ○   | ⊙   | ●                                  |  |  |  |  |

| <p><b>Key to Symbols:</b></p> <ul style="list-style-type: none"> <li>● The EE concept is the main focus of the Project WILD activity.</li> <li>⊙ The concept is one of the main focuses of the activity; is reinforced.</li> <li>○ The concept is not the main focus of the activity, but it is supported or reinforced.</li> </ul> <p><b>ENVIRONMENTAL EDUCATION GUIDELINES FOR LEARNING, 5–8</b></p> | <p><b>Fishy Who's Who</b><br/>(gr. 5–8, p. 8)</p> | <p><b>Whale of a Tail</b><br/>(gr. 5–8, p. 10)</p> | <p><b>Migration Headache</b><br/>(gr. 5–8, p. 15)</p> | <p><b>Designing a Habitat</b><br/>(gr. 5–8, p. 19)</p> | <p><b>Where Does Water Run?</b><br/>(gr. 5–8, p. 21)</p> | <p><b>Water Canaries</b><br/>(gr. 5–8, p. 24)</p> | <p><b>Wetland Metaphors</b><br/>(gr. 5–8, p. 39)</p> | <p><b>Hooks and Ladders</b><br/>(gr. 5–8, p. 43)</p> | <p><b>Micro Odyssey</b><br/>(gr. 5–8, p. 49)</p> | <p><b>Blue-Ribbon Niche</b><br/>(gr. 5–8, p. 52)</p> | <p><b>Pond Succession</b><br/>(gr. 5–8, p. 66)</p> |
|--|---|--|---|--|--|---|--|--|--|--|--|
| <b>STRAND 1—QUESTIONING AND ANALYSIS SKILLS</b>  |   |  |   |  |  |   |  |  |  |  |  |
| A. Questioning   |   |  | ○   |  | ○  |   |  | ○  |  |  |  |
| B. Designing investigations  |   |  | ○   |  | ○  |   |  |  |  |  |  |
| C. Collecting information  | ⊙   |  | ○   |  |  | ●   |  | ○  |  | ○  | ○  |
| D. Evaluating accuracy and reliability   |   |  |   |  |  |   |  |  |  |  |  |
| E. Organizing information  | ○   |  | ○   |  | ⊙  | ⊙   |  |  |  | ○  | ○  |
| F. Working with models and simulations   |   | ⊙  | ⊙   | ⊙  |  |   |  | ⊙  |  |  | ⊙  |
| G. Developing explanations   |   |  | ○   |  | ⊙  | ○   |  |  |  |  |  |
| <b>STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS</b>   |   |  |   |  |  |   |  |  |  |  |  |
| <b>2.1—The Earth as a Physical System</b>  |   |  |   |  |  |   |  |  |  |  |  |
| A. Processes that shape the Earth  |   |  |   |  | ○  |   |  |  |  |  | ○  |
| B. Changes in matter   |   |  |   |  |  |   |  |  |  |  |  |
| C. Energy  |   |  |   |  |  |   |  |  |  |  | ○  |
| <b>2.2—The Living Environment</b>  |   |  |   |  |  |   |  |  |  |  |  |
| A. Organisms, populations, and communities   | ⊙   | ○  | ○   | ⊙  |  | ⊙   | ○  | ○  | ⊙  | ⊙  | ○  |
| B. Heredity and evolution  |   |  |   |  |  |   |  |  | ○  |  |  |
| C. Systems and connections   | ○   |  |   | ⊙  | ○  | ○   | ○  | ⊙  | ⊙  | ⊙  | ○  |
| D. Flow of matter and energy   |   |  |   | ⊙  |  |   |  | ○  | ⊙  | ○  |  |
| <b>2.3—Humans and Their Societies</b>  |   |  |   |  |  |   |  |  |  |  |  |
| A. Individuals and groups  |   |  |   |  |  |   |  |  |  |  |  |
| B. Culture   |   |  |   |  |  |   |  |  |  |  |  |
| C. Political and economic systems  |   |  |   |  |  |   |  |  |  |  |  |
| D. Global connections  |   |  |   |  |  |   |  |  |  |  |  |
| E. Change and conflict   |   |  |   |  |  |   |  |  |  |  |  |
| <b>2.4—Environment and Society</b>   |   |  |   |  |  |   |  |  |  |  |  |
| A. Human/environment interactions  |   |  | ○   |  |  |   | ○  | ⊙  |  | ○  | ○  |
| B. Places  |   |  | ○   |  |  |   |  |  |  |  |  |
| C. Resources   |   |  | ○   |  |  |   | ○  |  |  |  |  |
| D. Technology  |   |  |   |  |  |   |  |  |  |  |  |
| E. Environmental issues  |   |  |   |  |  |   |  | ○  |  |  |  |

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|--|---|--|---|--|--|---|--|--|--|--|--|
| <b>STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES</b>   |   |  |   |  |  |   |  |  |  |  |  |
| <b>3.1—Skills for Analyzing and Investigating Environmental Issues</b>   |   |  |   |  |  |   |  |  |  |  |  |
| A. Identifying and investigating issues  |   |  |   |  |  |   |  | ○  |  |  |  |
| B. Sorting out the consequences of issues  |   |  |   |  |  |   |  | ○  |  |  |  |
| C. Identifying and evaluating alternative solutions and courses of action  |   |  |   |  |  |   |  | ○  |  |  |  |
| D. Working with flexibility, creativity, and openness  |   |  |   |  |  |   |  | ○  |  |  |  |
| <b>3.2—Decision-Making and Citizenship Skills</b>  |   |  |   |  |  |   |  |  |  |  |  |
| A. Forming and evaluating personal views   |   |  |   |  |  |   |  | ○  |  |  |  |
| B. Evaluating the need for citizen action  |   |  |   |  |  |   |  | ○  |  |  |  |
| C. Planning and taking action  |   |  |   |  |  |   |  | ○  |  |  |  |
| D. Evaluating the results of actions   |   |  |   |  |  |   |  | ○  |  |  |  |
| <b>STRAND 4—PERSONAL AND CIVIC RESPONSIBILITY</b>  |   |  |   |  |  |   |  |  |  |  |  |
| A. Understanding societal values and principles  |   |  |   |  |  |   |  |  |  |  |  |
| B. Recognizing citizens' rights and responsibilities   |   |  |   |  |  |   |  |  |  |  |  |
| C. Recognizing efficacy  |   |  |   |  |  |   |  |  |  |  |  |
| D. Accepting personal responsibility   |   |  |   |  |  |   |  |  |  |  |  |

| <p><b>Key to Symbols:</b></p> <ul style="list-style-type: none"> <li>● The EE concept is the main focus of the Project WILD activity.</li> <li>⦿ The concept is one of the main focuses of the activity; is reinforced.</li> <li>○ The concept is not the main focus of the activity, but it is supported or reinforced.</li> </ul> <p><b>ENVIRONMENTAL EDUCATION GUIDELINES FOR LEARNING, 5–8</b></p> | Eat and Glow (gr. 7–10, p. 69) | Edge of Home (gr. 5–8, p. 75) | Mermaids and Manatees (gr. 5–8, p. 80) | Net Gain, Net Effect (gr. 5–8, p. 85) | Watered-Down History (gr. 5–8, p. 91) | Water Wings (gr. 5–8, p. 110) | Puddle Wonders! (gr. 5–8, p. 114) | Riparian Retreat (gr. 5–8, p. 118) | How Wet Is Our Planet? (gr. 5–8, p. 121) | Watershed (gr. 5–8, p. 132) | What's in the Air? (gr. 5–8, p. 136) |
|--|--------------------------------|-------------------------------|--|---------------------------------------|---------------------------------------|-------------------------------|-----------------------------------|------------------------------------|--|-----------------------------|--------------------------------------|
| <b>STRAND 1—QUESTIONING AND ANALYSIS SKILLS</b>  |                                |                               |  |                                       |                                       |                               |                                   |                                    |  |                             |                                      |
| A. Questioning   |                                |                               |  |                                       | ⦿                                     |                               | ○                                 |                                    |  |                             |                                      |
| B. Designing investigations  |                                |                               |  |                                       | ⦿                                     |                               | ○                                 |                                    |  |                             |                                      |
| C. Collecting information  | ⦿                              | ○                             |  |                                       | ○                                     |                               | ○                                 |                                    | ○  | ⦿                           | ⦿                                    |
| D. Evaluating accuracy and reliability   |                                |                               |  |                                       |                                       |                               |                                   |                                    |  |                             |                                      |
| E. Organizing information  | ○                              |                               |  |                                       | ○                                     |                               | ○                                 |                                    | ○  |                             | ○                                    |
| F. Working with models and simulations   | ○                              |                               |  | ○                                     |                                       |                               |                                   |                                    |  |                             |                                      |
| G. Developing explanations   | ○                              |                               |  |                                       | ○                                     |                               | ○                                 |                                    |  |                             |                                      |
| <b>STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS</b>   |                                |                               |  |                                       |                                       |                               |                                   |                                    |  |                             |                                      |
| <b>2.1—The Earth as a Physical System</b>  |                                |                               |  |                                       |                                       |                               |                                   |                                    |  |                             |                                      |
| A. Processes that shape the Earth  |                                |                               |  |                                       |                                       |                               |                                   |                                    |  |                             |                                      |
| B. Changes in matter   |                                |                               |  |                                       |                                       |                               |                                   |                                    |  |                             |                                      |
| C. Energy  |                                |                               |  |                                       |                                       |                               |                                   |                                    |  |                             |                                      |
| <b>2.2—The Living Environment</b>  |                                |                               |  |                                       |                                       |                               |                                   |                                    |  |                             |                                      |
| A. Organisms, populations, and communities   | ⦿                              | ○                             | ○                                      |                                       |                                       |                               | ○                                 | ○                                  |  | ○                           |                                      |
| B. Heredity and evolution  | ○                              |                               |  |                                       |                                       |                               |                                   |                                    |  |                             |                                      |
| C. Systems and connections   | ○                              | ○                             | ○                                      |                                       |                                       | ○                             | ○                                 | ○                                  | ○  | ⦿                           |                                      |
| D. Flow of matter and energy   |                                | ○                             |  |                                       |                                       |                               |                                   |                                    |  |                             |                                      |
| <b>2.3—Humans and Their Societies</b>  |                                |                               |  |                                       |                                       |                               |                                   |                                    |  |                             |                                      |
| A. Individuals and groups  |                                |                               | ○                                      |                                       |                                       |                               |                                   |                                    |  |                             |                                      |
| B. Culture   |                                |                               |  |                                       |                                       |                               |                                   |                                    |  |                             |                                      |
| C. Political and economic systems  |                                |                               |  | ○                                     |                                       |                               |                                   |                                    |  |                             |                                      |
| D. Global connections  |                                |                               |  | ○                                     |                                       |                               |                                   |                                    | ○  |                             | ○                                    |
| E. Change and conflict   |                                |                               |  | ○                                     | ○                                     |                               |                                   |                                    |  | ○                           | ○                                    |
| <b>2.4—Environment and Society</b>   |                                |                               |  |                                       |                                       |                               |                                   |                                    |  |                             |                                      |
| A. Human/environment interactions  | ○                              |                               |  | ⦿                                     | ○                                     |                               |                                   | ○                                  | ○  | ⦿                           | ⦿                                    |
| B. Places  |                                |                               |  |                                       | ○                                     |                               |                                   |                                    |  |                             |                                      |
| C. Resources   |                                |                               |  | ⦿                                     | ○                                     |                               | ○                                 |                                    | ○  | ○                           | ○                                    |
| D. Technology  |                                |                               |  | ○                                     |                                       |                               |                                   |                                    |  | ○                           |                                      |
| E. Environmental issues  |                                |                               |  |                                       | ○                                     |                               |                                   |                                    | ○  | ○                           | ○                                    |

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|--|-----------------------------------|----------------------------------|---|--|--|----------------------------------|--------------------------------------|---------------------------------------|---|-----------------------------|---|
| <b>STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES</b>   |                                   |                                  |   |  |  |                                  |                                      |                                       |   |                             |   |
| <b>3.1—Skills for Analyzing and Investigating Environmental Issues</b>   |                                   |                                  |   |  |  |                                  |                                      |                                       |   |                             |   |
| A. Identifying and investigating issues  |                                   |                                  |   |  | ○  |                                  |                                      |                                       | ○   | ○                           | ○                                       |
| B. Sorting out the consequences of issues  |                                   |                                  |   |  | ○  |                                  |                                      |                                       | ○   | ○                           | ○                                       |
| C. Identifying and evaluating alternative solutions and courses of action  |                                   |                                  |   |  | ○  |                                  |                                      |                                       |   | ○                           | ○                                       |
| D. Working with flexibility, creativity, and openness  |                                   |                                  |   |  | ○  |                                  |                                      |                                       |   | ○                           | ○                                       |
| <b>3.2—Decision-Making and Citizenship Skills</b>  |                                   |                                  |   |  |  |                                  |                                      |                                       |   |                             |   |
| A. Forming and evaluating personal views   |                                   |                                  |   |  | ○  | ○                                |                                      | ○                                     |   |                             |   |
| B. Evaluating the need for citizen action  |                                   |                                  |   |  | ○  |                                  |                                      |                                       |   | ○                           | ○                                       |
| C. Planning and taking action  |                                   |                                  |   |  | ○  |                                  |                                      |                                       |   |                             |   |
| D. Evaluating the results of actions   |                                   |                                  |   |  | ○  |                                  |                                      |                                       |   |                             |   |
| <b>STRAND 4—PERSONAL AND CIVIC RESPONSIBILITY</b>  |                                   |                                  |   |  |  |                                  |                                      |                                       |   |                             |   |
| A. Understanding societal values and principles  |                                   |                                  |   |  |  | ○                                |                                      |                                       |   | ○                           | ○                                       |
| B. Recognizing citizens' rights and responsibilities   |                                   |                                  |   |  |  |                                  |                                      |                                       |   |                             |   |
| C. Recognizing efficacy  |                                   |                                  |   |  |  |                                  |                                      |                                       |   |                             |   |
| D. Accepting personal responsibility   |                                   |                                  |   |  |  |                                  |                                      |                                       |   |                             |   |

| <p><b>Key to Symbols:</b></p> <ul style="list-style-type: none"> <li>● The EE concept is the main focus of the Project WILD activity.</li> <li>⊙ The concept is one of the main focuses of the activity; is reinforced.</li> <li>○ The concept is not the main focus of the activity, but it is supported or reinforced.</li> </ul> <p><b>ENVIRONMENTAL EDUCATION GUIDELINES FOR LEARNING, 5–8</b></p> | <p><b>What's in the Water?</b><br/>(gr. 5–8, p. 140)</p> | <p><b>Something's Fishy Here!</b><br/>(gr. 5–8, p. 145)</p> | <p><b>Water's Going On?</b><br/>(gr. 5–8, p. 149)</p> | <p><b>Alice in Waterland</b><br/>(gr. 5–8, p. 151)</p> | <p><b>Turtle Hurdles</b><br/>(gr. 5–8, p. 158)</p> | <p><b>Aquatic Roots</b><br/>(gr. 5–8, p. 163)</p> | <p><b>Where Have All the Salmon Gone?</b> (gr. 5–8, p. 166)</p> | <p><b>To Dam or Not to Dam</b><br/>(gr. 5–8, p. 170)</p> | <p><b>Aquatic Times</b><br/>(gr. 5–8, p. 174)</p> | <p><b>Kelp Help</b> (gr. 5–8, p. 181)</p> | <p><b>Dragonfly Pond</b><br/>(gr. 5–8, p. 184)</p> |
|--|--|---|---|--|--|---|---|--|---|---|--|
| <b>STRAND 1—QUESTIONING AND ANALYSIS SKILLS</b>  |  |   |   |  |  |   |   |  |   |   |  |
| A. Questioning   |  |   |   |  |  | ○   |   | ○  |   |   | ○  |
| B. Designing investigations  |  |   |   |  |  | ○   | ○   | ○  |   |   | ○  |
| C. Collecting information  |  |   |   |  |  | ○   | ○   |  |   | ⊙   | ○  |
| D. Evaluating accuracy and reliability   |  |   |   |  |  |   |   |  |   |   |  |
| E. Organizing information  |  |   | ○   |  |  | ○   | ○   | ○  | ○   | ○   | ○  |
| F. Working with models and simulations   | ○  |   |   |  | ○  |   |   |  |   |   | ○  |
| G. Developing explanations   |  |   | ○   |  |  | ○   | ⊙   | ○  | ○   | ○   | ○  |
| <b>STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS</b>   |  |   |   |  |  |   |   |  |   |   |  |
| <b>2.1—The Earth as a Physical System</b>  |  |   |   |  |  |   |   |  |   |   |  |
| A. Processes that shape the Earth  | ○  |   |   |  |  |   |   | ○  |   |   |  |
| B. Changes in matter   |  |   |   |  |  |   |   |  |   |   |  |
| C. Energy  |  |   |   |  |  |   |   |  |   |   |  |
| <b>2.2—The Living Environment</b>  |  |   |   |  |  |   |   |  |   |   |  |
| A. Organisms, populations, and communities   |  |   |   |  | ●  | ○   | ⊙   | ○  | ○   | ⊙   | ⊙  |
| B. Heredity and evolution  |  |   |   |  |  |   |   |  |   |   |  |
| C. Systems and connections   |  | ○   |   | ○  | ●  | ○   | ⊙   | ○  | ○   | ⊙   | ⊙  |
| D. Flow of matter and energy   |  |   |   |  | ⊙  |   | ○   |  |   | ○   | ⊙  |
| <b>2.3—Humans and Their Societies</b>  |  |   |   |  |  |   |   |  |   |   |  |
| A. Individuals and groups  |  | ○   |   |  |  |   |   | ○  |   |   | ⊙  |
| B. Culture   |  |   |   |  |  |   |   | ○  |   |   | ○  |
| C. Political and economic systems  |  | ○   |   | ○  | ○  | ○   |   | ○  |   |   | ⊙  |
| D. Global connections  |  |   |   | ○  | ○  |   |   |  |   |   | ⊙  |
| E. Change and conflict   |  | ○   |   |  |  |   |   | ○  |   |   | ○  |
| <b>2.4—Environment and Society</b>   |  |   |   |  |  |   |   |  |   |   |  |
| A. Human/environment interactions  |  | ⊙   | ○   | ○  | ⊙  | ⊙   | ⊙   | ●  |   |   | ⊙  |
| B. Places  |  | ○   |   |  |  |   |   |  |   |   | ○  |
| C. Resources   |  | ○   | ○   | ○  |  |   | ○   |  |   |   |  |
| D. Technology  |  |   |   |  |  |   |   | ○  |   |   | ○  |
| E. Environmental issues  |  | ○   |   |  | ○  |   |   | ○  | ○   |   | ⊙  |

| <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>Key to Symbols:</b> <ul style="list-style-type: none"> <li>● The EE concept is the main focus of the Project WILD activity.</li> <li>⊙ The concept is one of the main focuses of the activity; is reinforced.</li> <li>○ The concept is not the main focus of the activity, but it is supported or reinforced.</li> </ul> </div> <b>ENVIRONMENTAL EDUCATION GUIDELINES FOR LEARNING, 5–8</b> | <b>What's in the Water?</b><br>(gr. 5–8, p. 140) | <b>Something's Fishy Here!</b><br>(gr. 5–8, p. 145) | <b>Water's Going On?</b><br>(gr. 5–8, p. 149) | <b>Alice in Waterland</b><br>(gr. 5–8, p. 151) | <b>Turtle Hurdles</b><br>(gr. 5–8, p. 158) | <b>Aquatic Roots</b><br>(gr. 5–8, p. 163) | <b>Where Have All the Salmon Gone?</b> (gr. 5–8, p. 166) | <b>To Dam or Not to Dam</b><br>(gr. 5–8, p. 170) | <b>Aquatic Times</b><br>(gr. 5–8, p. 174) | <b>Kelp Help</b> (gr. 5–8, p. 181) | <b>Dragonfly Pond</b><br>(gr. 5–8, p. 184) |
|--|--|---|---|--|--|---|--|--|---|------------------------------------|--|
| <b>STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES</b>   |  |   |   |  |  |   |  |  |   |                                    |  |
| <b>3.1—Skills for Analyzing and Investigating Environmental Issues</b>   |  |   |   |  |  |   |  |  |   |                                    |  |
| A. Identifying and investigating issues  | ○  | ⊙   | ○   | ○  | ⊙  | ○   | ○  | ⊙  | ○   |                                    | ⊙  |
| B. Sorting out the consequences of issues  | ○  | ⊙   | ○   | ○  | ⊙  | ○   | ○  | ⊙  | ○   |                                    | ⊙  |
| C. Identifying and evaluating alternative solutions and courses of action  | ○  | ⊙   | ○   | ○  | ○  |   | ○  | ⊙  |   |                                    | ⊙  |
| D. Working with flexibility, creativity, and openness  | ○  | ⊙   | ○   | ○  | ○  |   | ○  | ⊙  |   |                                    | ⊙  |
| <b>3.2—Decision-Making and Citizenship Skills</b>  |  |   |   |  |  |   |  |  |   |                                    |  |
| A. Forming and evaluating personal views   |  | ⊙   | ○   | ⊙  |  |   | ⊙  | ⊙  |   |                                    | ⊙  |
| B. Evaluating the need for citizen action  |  | ⊙   | ○   | ⊙  | ○  |   | ○  | ⊙  |   |                                    | ⊙  |
| C. Planning and taking action  |  | ⊙   | ○   | ⊙  |  |   |  |  |   |                                    | ⊙  |
| D. Evaluating the results of actions   |  | ⊙   | ○   | ⊙  | ○  |   |  |  |   |                                    | ⊙  |
| <b>STRAND 4—PERSONAL AND CIVIC RESPONSIBILITY</b>  |  |   |   |  |  |   |  |  |   |                                    |  |
| A. Understanding societal values and principles  |  | ○   | ○   | ○  |  |   |  | ○  |   |                                    | ⊙  |
| B. Recognizing citizens' rights and responsibilities   |  | ○   | ○   | ○  |  |   |  | ○  |   |                                    | ⊙  |
| C. Recognizing efficacy  |  | ⊙   | ⊙   | ⊙  | ○  |   |  | ○  |   |                                    | ⊙  |
| D. Accepting personal responsibility   | ○  | ⊙   | ⊙   | ⊙  | ○  |   |  |  |   |                                    | ⊙  |

## EXCELLENCE IN ENVIRONMENTAL EDUCATION: GUIDELINES FOR LEARNING, GRADES 9–12

### **GUIDELINES FOR 9–12<sup>TH</sup> GRADES**

*Learners should be able to meet the guidelines included in this section by the time they graduate from high school.*

*By the end of twelfth grade, learners are well on their way to environmental literacy. They should possess the basic skills and dispositions they need to understand and act on environmental problems and issues as responsible citizens—and to continue the learning process throughout their lives. In the ninth through twelfth grades, environmental education can promote active and responsible citizenship by challenging learners to hone and apply problem-solving, analysis, persuasive communication, and other higher level skills—often in real-world contexts.*

### **STRAND 1—QUESTIONING, ANALYSIS AND INTERPRETATION SKILLS**

**A) Questioning**—Learners are able to develop, modify, clarify, and explain questions that guide environmental investigations of various types. They understand factors that influence the questions they pose.

- Articulate environmental phenomena or topics to be studied at scales ranging from local to global.
- Pose a research question or hypothesis, identifying and defining key variables, based on primary and secondary sources of information. For example, develop hypotheses about land use in a region by drawing on maps, newspaper articles, databases, and personal observations.
- Identify historical and current ideas and beliefs—for example, about the environment, human perceptions of the environment, or the nature of knowledge—that inform their questions.

**B) Designing investigations**—Learners know how to design investigations to answer particular questions about the environment. They are able to develop approaches for investigating unfamiliar types of problems and phenomena.

- Select appropriate means of inquiry, including scientific investigations, historical inquiry, and social science observation and research.
- Select and develop appropriate problem solving strategies for conducting environmental investigations.
- Incorporate a wide range of tools and technologies as appropriate, including complex maps, measurement instruments and processes, and computer-based analysis.

**C) Collecting information**—Learners are able to locate and collect reliable information for environmental investigations of many types. They know how to use sophisticated technology to collect information, including computer programs that access, gather, store, and display data.

- Use basic sampling techniques such as spatial sampling and random sampling. Evaluate when these techniques are appropriate.
- Apply data collection skills in field situations, such as interviewing community members about environmental concerns or sampling water in a local stream.
- Gather information from a variety of sources including historical sites, censuses, tax records, statistical compilations, economic indicators, interviews or surveys, geographical information systems, and other data banks.
- Adjust information collection strategies to compensate for potential bias in information sources.
- Perform basic statistical analyses to describe data using quantitative measures such as mean, median and mode.

**D) Evaluating accuracy and reliability**—Learners can apply basic logic and reasoning skills to evaluate completeness and reliability in a variety of information sources.

- Identify logical errors and spurious statements in everyday situations such as political speeches about the environment or commercial advertising.
- Look for and explain flaws such as faulty or misleading use of statistics, misrepresentation of data that is presented graphically, or biased selection of data to support a claim. For example, analyze the public debate over an environmental issue. Examine speeches, advertisements, news releases, and pamphlets put out by groups on various sides of the issue.
- Explain why some research results are judged to be more credible than are others. Consider factors such as possible sources of bias in interpretation, funding sources, and research procedures.

**E) Organizing information**—Learners are able to organize and display information in ways appropriate to different types of environmental investigations and purposes.

- Attend to details such as the type and accuracy of data, scale, accuracy of representation, and ease of interpretation.
- Evaluate the strengths and weaknesses of the particular means of presentation for different purposes.
- Work with technology designed to relate and display data, such as database and mapping software.
- Integrate and summarize information using a variety of media ranging from written texts to graphic representations, and from audiovisual materials to maps and computer-generated images.

**F) Working with models and simulations**—Learners are able to create, use, and evaluate models to understand environmental phenomena.

- Use algebraic and geometric models to represent processes or objects such as movement along earthquake fault lines, traffic flows, or population growth.
- Use computers to create models and simulations. For example, project the effects of habitat fragmentation on species diversity, the air-quality effects of a new factory, the economic impacts of proposed water quality rules, or the visual changes a new housing development will make on the landscape.
- Compare the applicability of models for particular situations, considering the models' assumptions as one factor. Explain how a single model may apply to more than one situation and how many models may represent a single situation.
- Evaluate and report the limitations of models used.

**G) Drawing conclusions and developing explanations**—Learners are able to use evidence and logic in developing proposed explanations that address their initial questions and hypotheses.

- Use basic statistical analysis and measures of probability to make predictions and develop interpretations based on data.
- Differentiate between causes and effects and identify when causality is uncertain.
- Speak in general terms about their confidence in proposed explanations as well as possible sources of uncertainty and error. Distinguish between error and unanticipated results in formulating explanations. Consider the assumptions of models and measuring techniques or devices as possible sources of error.
- Identify what would be needed to reject the proposed explanation or hypothesis.
- Based on experience, develop new questions to ground further inquiry. For example, draw on the results of a stream-monitoring project to develop questions that guide an investigation into water quality issues in the community or the watershed.

## STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS

### Strand 2.1—The Earth as a Physical System

**A) Processes that shape the Earth**—Learners understand the major physical processes that shape the Earth. They can relate these processes, especially those that are large-scale and long-term, to characteristics of the Earth.

- Relate different types of climate to processes such as the transfer of heat energy, wind and ocean currents, and the cycling of water.
- Use examples such as the El Niño effect or the Santa Ana winds to illustrate how changes in wind patterns or ocean temperatures can affect weather in different parts of the world.
- Explain distinctive landforms in terms of the physical processes (particularly those related to changes in the Earth’s crust or long-term processes such as erosion) that shaped them.
- Describe possible relationships between surface water and ground water. For example, create a model or a cross-sectional drawing that shows surface- and groundwater flows in a local drainage system. Explain why surface and ground water are related in these ways.

**B) Changes in matter**—Learners apply their understanding of chemical reactions to round out their explanations of environmental characteristics and everyday phenomena.

- Explain everyday chemical reactions such as burning fossil fuels, photosynthesis, or the creation of smog in terms such as the release or consumption of energy, the products of these reactions, and how these products may be involved in further chemical reactions and/or affect biogeochemical cycles.
- Explain the chemical components of biological processes such as photosynthesis, respiration, nitrogen fixation, or decomposition, and how biological and physical processes fit in the overall process of biogeochemical cycling.
- Explain why elements cycle through the biosphere at different rates, describing influences on reaction rates. (Oxygen and nitrogen cycle quickly, for example, while phosphorus tends to be released from its immobile form more slowly, depending upon factors such as soil acidity.)

**C) Energy**—Learners apply their knowledge of energy and matter to understand phenomena in the world around them.

- Compare different means of generating electricity (such as coal-burning plants, nuclear fusion reactors, wind, geothermal, and hydropower) in terms of the transformation of energy among forms, the relationship of matter and energy, and efficiency/production of heat energy.
- Explain differences in conductivity among materials and relate these ideas to real-world phenomena.
- Use the laws of thermodynamics to explain why natural systems need a certain amount of energy input to maintain their organization.

### Strand 2.2—The Living Environment

**A) Organisms, populations, and communities**—Learners understand basic population dynamics and the importance of diversity in living systems.

- Discuss the relationship of habitat changes to plant and animal populations. Consider such factors as variations in habitat size, fragmentation, and fluctuation in conditions such as pH, oxygen, available light, or water level. For example, describe the effects of a lake’s eutrophication on plant, insect, bacteria, and fish populations.
- Discuss some of the ways in which populations can change over time, using ideas such as cyclic fluctuations, equilibrium, and coupled oscillations. Evaluate influences on population growth rate, including reproductive strategies and resource limitations.
- Explain how diversity of characteristics among organisms of a species increases the likelihood of the species surviving changing environmental conditions.
- Explain how variation among species in a system increases the likelihood that at least some species will survive changes in environmental conditions.

**B) Heredity and evolution**—Learners understand the basic ideas and genetic mechanisms behind biological evolution.

- Describe the mechanisms of natural selection, incorporating factors such as genetic variation, the effect of heritable characteristics on individual survival and reproduction within a given environment, and the effects of environmental change.
- Use the theory of natural selection and concepts such as mutation, gene flow, and genetic drift to account for the adaptation of species to specific environments.
- Explain the idea that the more biological diversity there is today, the more there may be in the future. Offer examples of exceptions to this general rule, and use it to help explain past mass extinctions.

**C) Systems and connections**—Learners understand the living environment to be comprised of interrelated, dynamic systems.

- Apply the concepts of ecosystem and ecoregion to organize the multitude of relationships among organisms and environments encountered in earlier studies.
- Discuss the interactions among organisms and their environments. Explain ecosystem change with respect to variables such as climate change, the introduction of new species, and human impacts; and explain processes such as desertification and soil formation as mechanisms for such change.
- Describe succession in ecosystems and their constituent plant and animal communities. Illustrate this idea with examples such as the slow transformation of a volcanic island from barren rock to rain forest as initial plant colonizers create conditions favorable to other species, or the more rapid changes that occur after beavers dam a stream.
- Describe how adding a species to, or removing one from, an ecosystem may affect other organisms and the entire system.

**D) Flow of matter and energy**—Learners are able to account for environmental characteristics based on their knowledge of how matter and energy interact in living systems.

- Illustrate how energy for life is provided primarily by continual inputs from the sun, captured by plants through photosynthesis and converted into carbon-based molecules. Describe exceptions such as geothermal and natural nuclear energy.
- Trace the flow of matter and energy through living systems, and between living systems and the physical environment. For example, show how oxygen is released to the atmosphere by the interaction of plants, animals, and non-living matter in the carbon cycle, or use the carbon cycle to explain the existence of fossil energy sources.
- Explain how the abundance and distribution of living organisms are limited by the available energy and certain forms of matter such as water, oxygen, and minerals.

### **Strand 2.3—Humans and Their Societies**

**A) Individuals and groups**—Learners understand the influence of individual and group actions on the environment, and how groups can work to promote and balance interests.

- Predict how the environmental effects of their personal actions might change over time. Consider variables such as technological advances, lifestyle changes, or taking on such roles as business owners, employees in various careers, or parents.
- Analyze how the actions of societal organizations such as businesses or community groups may have environmental consequences and other impacts that go beyond the intended aims of the group.
- Describe how particular groups meet or balance individual needs, group goals, and the common societal good. Use examples such as conservation organizations, organizations of professionals in environmental or resource management fields, community associations, or business groups.

**B) Culture**—Learners understand cultural perspectives and dynamics and apply their understanding in context.

- Analyze how cultural change and altered views of the environment are related. For example, discuss how the shift away from a largely rural society to a predominantly urban one may influence changing perceptions of the environment.

- Recognize diverse cultural views about humans and the environment. Anticipate ways in which people from different cultural perspectives and frames of reference might interpret data, events, or policy proposals.
- Describe and compare historical and contemporary societal strategies for adapting to environmental or social change while preserving and transmitting culture. For example, describe ways resource-dependent communities (those whose economies traditionally relied on activities such as mining or timber harvest) work to maintain their identities in the face of mine closures or declining timber harvests.

**C) Political and economic systems**—Learners understand how different political and economic systems account for, manage, and affect natural resources and environmental quality.

- Explain the development of economic systems using the economic idea of scarcity and the geographic idea of uneven distribution of resources.
- Compare the U.S. political and economic systems with other types of systems, focusing on how the systems govern the use of natural resources, control production and consumption, and protect environmental quality.
- Evaluate the environmental and societal costs and benefits of allocating goods and services in different ways (e.g. through public or private sectors). For example, explain problems such as over-fishing, over-grazing, and deforestation considering what can happen to resources that are commonly owned and openly accessible, or examine successful common property management systems that promote sustainable use of resources.
- Explain current and historical environmental issues in terms of political and economic ideas. For example, analyze the role of private property rights and the concept of general welfare in shaping decisions about the use and protection of wetlands in the United States.
- Evaluate the structure and functions of the United Nations and its agencies in addressing global environmental issues.

**D) Global connections**—Learners are able to analyze global social, cultural, political, economic, and environmental linkages.

- Explain regional and national economic specialization and international trade in terms of uneven distribution of resources and differing costs of producing similar goods (due to factors such as climate, labor costs, and energy costs).
- Describe global connections in systems such as the economy, transportation, and communication. Evaluate the effects of changes in these systems on communities and the environment on a global scale. Consider instances in which global linkages are strong, and in which they are relatively weak.
- Evaluate the connections among interests, decisions, and actions taken at the individual, community, regional, national, and global levels. Consider their effect on global issues such as human rights, economic development, health, resource allocation, and environmental quality. For example, examine the influence of factors such as consumer preferences, U.S. foreign policy, international treaties and governing bodies, international nongovernmental organizations, and corporate operations on agricultural practices in developing nations.

**E) Change and conflict**—Learners understand the functioning of public processes for promoting and managing change and conflict, and can analyze their effects on the environment.

- Explain how public decision-making about the environment takes into account (or fails to account for) uneven distribution of, or different types of, costs and benefits; future or distant consequences; and difficulties assessing the value of certain costs or benefits such as ecosystem services or clean air.
- Evaluate the role of social, political, and economic institutions in the United States in managing change and conflict regarding environmental issues. Account for the influence of institutions such as the legal system and property rights as well as organizations such as banks, nonprofit groups, corporations, and special interest groups.

- Evaluate the conditions and motivations that lead to conflict, cooperation, and change among individuals, groups, and nations. Look particularly at the effects of these forces on the control of natural resources. For example, examine the origins and effects of international treaties and accords on whaling or commercial fishing.
- Evaluate various governmental and non-governmental strategies for promoting social change. For example, trace the strategies used by different groups to reduce energy use in the U.S.

## **Strand 2.4—Environment and Society**

**A) Human/environment interactions**—Learners understand that humans are able to alter the physical environment to meet their needs and that there are limits to the ability of the environment to absorb impacts or meet human needs.

- Evaluate ways in which technology has changed humans’ ability to alter the environment and its capacity to support humans and other living organisms. Consider technologies that have had impacts learners see as positive, as well as negative.
- Analyze specific examples of environmental change in terms of qualitative and quantitative costs and benefits for different groups of people and specific species or ecosystems.
- Describe factors that limit the physical environment’s capacity to support particular types of human activity such as suburban development, flood control, or particular agricultural practices.
- Evaluate the cumulative effects of human actions on a specific species or environmental system, such as a stream or a watershed.
- Use the concepts of carrying capacity and ecological footprint to analyze the sustainability of current trends in world population growth and natural resource consumption.

**B) Places**—Learners understand “place” as humans endowing a particular part of the Earth with meaning through their interactions with that environment.

- Analyze how places change over time as the physical environment changes and as human use and perceptions change. For example, examine the effects of automobiles and the interstate highway system on different places.
- Explain the importance of places to human identity. For example, discuss changes in land use and personal and community identity that occur in a rapidly growing town or city, or one in which the economy has stagnated.
- Describe how regions change over time, examining factors such as human migration and population change, technological change, environmental degradation, and seismic activity. For example, trace the causes of the desiccation of the Aral Sea and the changes it has prompted in that region of Russia.

**C) Resources**—Learners understand that the importance and use of resources change over time and vary under different economic and technological systems.

- Explain differences in the consumption of resources among nations using factors such as population size, cultural practices, and varied geographic or economic distribution of resources.
- Describe how changes in technology alter the use of resources. Illustrate with examples such as the ability to harvest timber on steep slopes using helicopters or building technologies that incorporate nontraditional or recycled materials.
- Evaluate public policies related to resource use. Consider variables such as their impacts on the resource and short- and long-term economic effects. For example, anticipate the relationship between water use and the growth of a city like Las Vegas, Nevada, which is in a desert area that receives only four inches of rainfall per year.
- Identify ways in which various resources can be recycled and reused. Evaluate the viability of recycling based on economic and technological factors, spatial variables such as distance from recycling facility to markets, and possible future developments. For example, discuss factors that influenced the development of the steel or plastics recycling industry in the United States.

**D) Technology**—Learners are able to examine the social and environmental impacts of various technologies and technological systems.

- Explain how social and economic forces influence the direction of technological development, and how technologies shape societal values and beliefs. For example, consider the ability to build large dams for water storage or hydropower, or the social impact of the first photos of the Earth from space.
- Using examples of particular technologies (such as genetic manipulation or cyanide heap leach gold mining) or technological systems (such as modern agriculture or energy production and use), discuss the social and environmental costs, benefits, risks, and possibilities associated with technologies through which humans shape and control their environment.
- Discuss ways in which technological advances have lessened the adverse environmental impacts of human activities.

**E) Environmental issues**—Learners are familiar with a range of environmental issues at scales that range from local to national to global. They understand that these scales and issues are often linked.

- Evaluate a range of costs and benefits of particular policies that affect the environment. For example, consider the effects of free trade agreements on the ability of signatory nations to protect the environment, or examine the effects of programs for trading “pollution credits” among companies.
- Place local issues in the context of broader or larger-scale issues, drawing parallels, and noting important similarities and differences. Use the broader issue to point to important local dynamics or perspectives of which to be aware. For example, consider local air pollution problems in the context of larger issues such as global climate change or acid precipitation in other parts of the country.
- Identify links among issues, for example the relationships among traffic congestion, poor air quality, and suburban sprawl. Explain key relationships among technological, social, ecological, economic, and other aspects of issues.

## **STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES**

### **Strand 3.1—Skills for Analyzing and Investigating Environmental Issues**

**A) Identifying and investigating issues**—Learners apply their research and analytical skills to investigate environmental issues ranging from local issues to those that are regional or global in scope.

- Define and clearly articulate issues to be investigated. Characterize the issue considering factors such as connections with other issues, the pervasiveness of its effects, whether it is a long-term issue or one that is motivated by a sudden change or crisis, and whether it is unique to a particular area.
- Identify key individuals and groups involved. Identify different perspectives on the issue and approaches to resolving it. Discuss assumptions and goals that underlie each position.
- Examine contextual elements that shape the issue and alternative courses of action. Use these to identify relevant historical antecedents or contemporary parallels to the selected issue. For example, in studying questions surrounding the preservation of natural areas in Central America, students may look for similar issues in other developing nations, regions where people maintain traditional or subsistence uses of the land, or areas with similar governmental regimes.
- Investigate the issue as well as similar issues and proposals using secondary sources of information.
- Where needed, conduct original research, applying research methods from the natural and social sciences. For example, survey a community about an environmental issue using a random sample or test soils for the presence of contaminants.

**B) Sorting out the consequences of issues**—Learners are able to evaluate the consequences of specific environmental changes, conditions, and issues for human and ecological systems.

- Evaluate the consequences of an environmental issue. For example, bring to bear historical perspectives, an understanding of the impacts of different technological developments, and knowledge of similar issues.
- Discuss the social, political, economic, and ethical implications of environmental issues. For example, trace the root causes of a community’s solid waste problem and the effects of the problem and likely consequences of siting a landfill in different areas for different groups of people.
- Project the likely consequences for specific human and environmental systems of failure to resolve the issue.
- Use the idea of cumulative effects to explain why one set of environmental changes or human actions cannot be considered in isolation from others.

**C) Identifying and evaluating alternative solutions and courses of action**—Learners are able to identify and propose action strategies that are likely to be effective in particular situations and for particular purposes.

- Synthesize different perspectives, types of data, and means of analysis to propose solutions to environmental issues.
- Apply knowledge of functional relationships, modeling, and statistical analysis to evaluating issues and different approaches to resolving them. For example, do basic traffic flow analyses to project the likely affects of commercial developments at the outskirts of town and evaluate alternative solutions such as widening roads, providing bus service, or changing the location of the development. Predict other likely consequences of different approaches to resolving projected traffic problems associated with the new stores.
- Evaluate proposed solutions using gauges such as likely impacts on society or the environment and likely effectiveness in resolving the issue. Use methods such as cost/benefit analysis, cumulative effects analysis, environmental impact analysis, ethical analysis, and risk analysis. Describe the strengths and weaknesses of each method, considering the main ideas behind each approach including which effects are important to look at and which values or societal goals it tries to protect.
- Define and provide examples of citizen action appropriate to proposed solutions.

**D) Working with flexibility, creativity, and openness**—While environmental issues investigations can bring to the surface deeply held views, learners are able to engage each other in peer review conducted in the spirit of open inquiry.

- Question, offer alternative explanations, and defend interpretations in group discussions.
- Understand and explain the importance of such characteristics as honesty, openness, skepticism, and suspending judgment in the process of building knowledge.
- Discuss when and how characteristics such as openness and decisiveness are valuable in addressing environmental issues.

### **Strand 3.2—Decision-Making and Citizenship Skills**

**A) Forming and evaluating personal views**—Learners are able to communicate, evaluate, and justify their own views on environmental issues and alternative ways to address them.

- Articulate a position on an environmental issue. Justify the position based on an analysis of information from a variety of sources, personal beliefs and values, and clear reasoning.
- Evaluate personal beliefs and values using criteria such as personal well-being; social and environmental welfare; economic vitality; and concern for other living beings.
- Articulate elements of their own environmental ethic and discuss whether personal positions on issues are consistent with this ethic.
- Consider viewpoints that differ from their own, and information that challenges their position. Evaluate whether and how such information might affect their views.

**B) Evaluating the need for citizen action**—Learners are able to decide whether action is needed in particular situations and whether they should be involved.

- Evaluate whether action is warranted in specific situations, accounting for factors such as available evidence about the issue and proposed solutions; the scale of the issue; legal, social, economic, and ecological consequences; and alternatives to citizen action.
- Evaluate whether personal involvement in particular actions is warranted, considering factors such as their own values, skills, resources, and commitment.
- Communicate decisions clearly, articulating well-reasoned arguments supporting their views and decisions.

**C) Planning and taking action**—Learners know how to plan for action based on their research and analysis of an environmental issue. If appropriate, they take actions that are within the scope of their rights and consistent with their abilities and responsibilities as citizens.

- Develop plans for individual and collective action involving groups such as a small group of classmates, a school club, a community organization, or a church. Include clear reasons and goals for action. In planning, refer to their knowledge of a range of citizen action strategies and the results of their environmental issue investigations.
- Develop action plans based on an understanding of the complexity of the issue. Set realistic goals and include measures of success consistent with their abilities and the capacities of the groups involved.
- Decide whether their plan should be implemented immediately or at another time, modified, or abandoned; and carry through with action when appropriate.

**D) Evaluating the results of actions**—Learners are able to evaluate the effects of their own actions and actions taken by other individuals and groups.

- Discuss the intended and unintended effects of citizen actions on specific environmental issues. Consider the apparent effects of citizen action on the environment, the political situation, and the individuals involved. Illustrate with examples such as a demonstration at a nuclear test facility, a local watershed festival, or a citizen lobbying effort against proposed environmental regulations.
- Analyze their own actions, evaluating apparent effects in terms of learners' goals, ethics, and broader societal goals. Develop a "lessons learned" document or presentation.
- Account for some of the difficulties they encounter in evaluating the results of their actions.

## **STRAND 4—PERSONAL AND CIVIC RESPONSIBILITY**

**A) Understanding societal values and principles**—Learners know how to analyze the influence of shared and conflicting societal values.

- Identify shared political values and principles that unite U.S. citizens and analyze conflicting views about their meaning and application. For example, examine conflicting views about how to protect general welfare and private property rights in a specific land-use decision where a lawsuit has been filed alleging a "taking" of private property rights by the government.
- Analyze how societal institutions, such as banks, corporations, nonprofit organizations, lobbying groups, government agencies, and the courts, embody and perpetuate certain societal values and principles.
- Describe and suggest ways that individuals can work to change how societal institutions function and, consequently, to change their environmental impacts.

**B) Recognizing citizens' rights and responsibilities**—Learners understand the importance of exercising the rights and responsibilities of citizenship.

- Evaluate conflicts between individual rights and other societal interests such as a healthy environment. Discuss when individuals' civic obligations require them to subordinate their personal interests or desires to the public good.
- Explain the importance and evaluate the usefulness of civic dispositions such as trust, patience, self-discipline, respect, and open-mindedness to individuals and to society.

- Explain the influence of citizen action and public opinion on particular policy decisions that affect the environment.
- Reflect on the impact of citizen participation— particularly learners’ own—on public concerns related to the environment and on the community.

**C) Recognizing efficacy**—Learners possess a realistic self-confidence in their effectiveness as citizens.

- Evaluate the extent to which individual and group action creates change, meets individual needs, and promotes the common good.
- Identify ways in which learners, individually and collectively, are able to help maintain environmental quality and resolve problems and issues. Provide examples from the range of communities (e.g., family, club or group, school, town, state, nation, world) in which learners see themselves as members.

**D) Accepting personal responsibility**—Learners understand that their actions can have broad consequences and accept responsibility for recognizing those effects and changing their actions when necessary.

- Evaluate the effects of their actions (and the actions of the larger social groups of which they are part) on the environment, other humans, and other living things.
- Explain ways in which the decisions of one generation create opportunities and impose constraints for future generations. Illustrate this idea with examples from the past, and incorporate it into their analyses of issues.
- Evaluate the importance of fulfilling personal responsibilities for themselves, society, and the environment.
- Demonstrate a willingness to work individually and collectively toward the resolution of environmental issues and to participate thoughtfully and effectively in environmental decision-making.

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|---|--|-------------------------------------|----------------------------------|------------------------------------|-----------------------------------|-------------------------------------|---|------------------------------------|-------------------------------------|---|---|-----------------------------------|
| <b>STRAND 1—QUESTIONING AND ANALYSIS SKILLS</b>   |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   |   |                                   |
| A. Questioning  | ⊙  |                                     |                                  | ⊙                                  |                                   | ○                                   | ○   |                                    | ⊙                                   | ○   | ⊙                                       |                                   |
| B. Designing investigations   | ⊙  |                                     | ○                                | ⊙                                  |                                   | ○                                   |   |                                    |                                     |   | ⊙                                       |                                   |
| C. Collecting information   | ⊙  |                                     | ○                                | ○                                  | ○                                 | ⊙                                   |   |                                    | ⊙                                   | ○   | ⊙                                       | ○                                 |
| D. Evaluating accuracy and reliability  |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   | ○                                       |                                   |
| E. Organizing information   |  |                                     | ○                                | ⊙                                  | ○                                 | ⊙                                   | ○   |                                    |                                     |   | ○                                       | ○                                 |
| F. Working with models and simulations  |  | ⊙                                   | ○                                | ●                                  |                                   | ●                                   |   | ⊙                                  |                                     |   |   |                                   |
| G. Developing explanations  |  | ○                                   | ⊙                                | ●                                  | ○                                 | ⊙                                   |   | ○                                  |                                     |   | ○                                       | ○                                 |
| <b>STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS</b>  |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   |   |                                   |
| <b>2.1—The Earth as a Physical System</b>   |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   |   |                                   |
| A. Processes that shape the Earth   |  |                                     |                                  | ⊙                                  | ○                                 |                                     |   | ○                                  |                                     |   |   |                                   |
| B. Changes in matter  |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   |   |                                   |
| C. Energy   |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   |   |                                   |
| <b>2.2—The Living Environment</b>   |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   |   |                                   |
| A. Organisms, populations, and communities  |  | ●                                   | ⊙                                | ●                                  |                                   | ●                                   |   |                                    |                                     |   |   |                                   |
| B. Heredity and evolution   |  |                                     | ○                                | ⊙                                  | ⊙                                 | ●                                   |   |                                    |                                     |   |   |                                   |
| C. Systems and connections  |  | ⊙                                   | ●                                | ●                                  |                                   | ○                                   |   | ⊙                                  |                                     |   |   |                                   |
| D. Flow of matter and energy  |  |                                     | ○                                | ○                                  |                                   |                                     |   |                                    |                                     |   |   |                                   |
| <b>2.3—Humans and Their Societies</b>   |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   |   |                                   |
| A. Individuals and groups   |  |                                     |                                  |                                    |                                   |                                     | ○   | ○                                  |                                     |   | ⊙                                       |                                   |
| B. Culture  |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   | ○                                       |                                   |
| C. Political and economic systems   |  |                                     |                                  |                                    |                                   |                                     |   | ○                                  | ⊙                                   | ○   |   | ⊙                                 |
| D. Global connections   |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   |   |                                   |
| E. Change and conflict  |  |                                     |                                  |                                    |                                   |                                     |   |                                    | ○                                   | ⊙   | ○                                       | ⊙                                 |
| <b>2.4—Environment and Society</b>  |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   |   |                                   |
| A. Human/environment interactions   |  | ○                                   |                                  |                                    | ○                                 | ○                                   |   | ○                                  |                                     |   |   |                                   |
| B. Places   |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   |   |                                   |
| C. Resources  |  |                                     |                                  |                                    |                                   |                                     |   | ⊙                                  |                                     |   |   | ○                                 |
| D. Technology   |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   |   |                                   |
| E. Environmental issues   | ○  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   |   |                                   |

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| <b>STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES</b>  |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   |   |                                   |
| <b>3.1—Skills for Analyzing and Investigating Environmental Issues</b>  |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   |   |                                   |
| A. Identifying and investigating issues   | ○  |                                     |                                  |                                    |                                   | ○                                   |   |                                    | ⊙                                   | ○   | ●                                       | ○                                 |
| B. Sorting out the consequences of issues   | ○  |                                     |                                  |                                    |                                   | ○                                   |   |                                    | ○                                   | ⊙   | ○                                       | ○                                 |
| C. Identifying and evaluating alternative solutions and courses of action   |  |                                     |                                  |                                    |                                   | ○                                   |   | ○                                  | ○                                   | ⊙   | ○                                       | ○                                 |
| D. Working with flexibility, creativity, and openness   |  |                                     |                                  |                                    |                                   |                                     |   |                                    | ○                                   | ⊙   | ●                                       | ○                                 |
| <b>3.2—Decision-Making and Citizenship Skills</b>   |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   |   |                                   |
| A. Forming and evaluating personal views  |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     | ⊙   | ⊙                                       | ○                                 |
| B. Evaluating the need for citizen action   |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     | ⊙   |   |                                   |
| C. Planning and taking action   |  |                                     | ○                                |                                    |                                   |                                     |   |                                    |                                     | ⊙   |   |                                   |
| D. Evaluating the results of actions  |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     | ⊙   |   |                                   |
| <b>STRAND 4—PERSONAL AND CIVIC RESPONSIBILITY</b>   |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     |   |   |                                   |
| A. Understanding societal values and principles   |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     | ⊙   | ⊙                                       | ○                                 |
| B. Recognizing citizens' rights and responsibilities  |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     | ●   | ○                                       | ⊙                                 |
| C. Recognizing efficacy   |  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     | ●   | ○                                       | ○                                 |
| D. Accepting personal responsibility  | ○  |                                     |                                  |                                    |                                   |                                     |   |                                    |                                     | ●   |   | ○                                 |

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|---|--|--|---|--|---|---|---|--|--|---|--|---|
| <b>STRAND 1—QUESTIONING AND ANALYSIS SKILLS</b>   |  |  |   |  |   |   |   |  |  |   |  |   |
| A. Questioning  |  | ●  |   | ○  | ⊙   |   |   | ●  |  |   | ⊙  |   |
| B. Designing investigations   |  | ⊙  |   |  | ⊙   |   |   | ●  |  |   | ⊙  |   |
| C. Collecting information   |  | ⊙  |   |  | ⊙   | ⊙   |   | ⊙  | ●  |   | ⊙  | ○   |
| D. Evaluating accuracy and reliability  |  | ○  |   |  |   |   |   |  |  |   |  |   |
| E. Organizing information   | ○  | ⊙  |   |  | ○   | ○   |   | ⊙  | ○  |   | ○  |   |
| F. Working with models and simulations  |  |  | ○   |  |   |   |   |  |  |   |  |   |
| G. Developing explanations  | ○  | ⊙  |   | ○  | ○   | ○   |   | ⊙  | ⊙  |   | ○  | ○   |
| <b>STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS</b>  |  |  |   |  |   |   |   |  |  |   |  |   |
| <b>2.1—The Earth as a Physical System</b>   |  |  |   |  |   |   |   |  |  |   |  |   |
| A. Processes that shape the Earth   |  |  |   |  |   |   |   |  |  |   |  |   |
| B. Changes in matter  |  |  |   |  |   |   |   |  |  |   |  |   |
| C. Energy   |  |  |   |  |   |   |   |  |  |   |  |   |
| <b>2.2—The Living Environment</b>   |  |  |   |  |   |   |   |  |  |   |  |   |
| A. Organisms, populations, and communities  | ○  |  | ○   | ⊙  | ⊙   | ○   | ○   |  | ○  |   |  | ⊙   |
| B. Heredity and evolution   |  |  |   |  |   |   |   |  |  |   |  |   |
| C. Systems and connections  | ○  |  |   | ○  | ⊙   | ○   | ○   |  |  |   |  | ○   |
| D. Flow of matter and energy  |  |  |   |  |   |   |   |  |  |   |  | ○   |
| <b>2.3—Humans and Their Societies</b>   |  |  |   |  |   |   |   |  |  |   |  |   |
| A. Individuals and groups   | ○  |  |   |  |   |   | ○   |  |  | ○   |  | ○   |
| B. Culture  |  |  |   |  |   |   | ○   |  |  |   |  |   |
| C. Political and economic systems   |  |  |   | ○  |   |   |   |  |  |   |  |   |
| D. Global connections   |  |  |   |  |   |   |   |  |  |   |  |   |
| E. Change and conflict  | ○  |  |   | ○  |   |   |   |  |  |   |  | ○   |
| <b>2.4—Environment and Society</b>  |  |  |   |  |   |   |   |  |  |   |  |   |
| A. Human/environment interactions   | ○  |  |   | ⊙  | ⊙   | ○   |   |  |  |   | ⊙  | ⊙   |
| B. Places   |  |  |   |  | ○   |   |   |  |  |   |  | ○   |
| C. Resources  |  |  |   |  | ○   |   |   |  |  |   |  | ○   |
| D. Technology   |  |  |   | ○  |   |   |   |  |  |   |  | ○   |
| E. Environmental issues   |  |  |   |  | ○   |   | ○   |  |  |   |  | ○   |

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|---|--|--|-----------------------------------|----------------------------------|---|-------------------------------------|---|--------------------------------------|--|---------------------------------|----------------------------|---|
| <b>STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES</b>  |  |  |                                   |                                  |   |                                     |   |                                      |  |                                 |                            |   |
| <b>3.1—Skills for Analyzing and Investigating Environmental Issues</b>  |  |  |                                   |                                  |   |                                     |   |                                      |  |                                 |                            |   |
| A. Identifying and investigating issues   | ○                                      | ●  |                                   | ◎                                | ◎   |                                     | ○   |                                      |  | ●                               | ●                          |   |
| B. Sorting out the consequences of issues   | ◎                                      | ◎  |                                   | ◎                                | ◎   |                                     |   |                                      |  | ●                               | ●                          |   |
| C. Identifying and evaluating alternative solutions and courses of action   | ○                                      | ◎  |                                   | ◎                                | ◎   |                                     |   |                                      |  | ●                               | ●                          |   |
| D. Working with flexibility, creativity, and openness   | ○                                      | ●  |                                   | ◎                                | ◎   |                                     |   |                                      |  | ●                               | ●                          |   |
| <b>3.2—Decision-Making and Citizenship Skills</b>   |  |  |                                   |                                  |   |                                     |   |                                      |  |                                 |                            |   |
| A. Forming and evaluating personal views  | ○                                      | ◎  |                                   | ◎                                | ◎   |                                     | ○   |                                      |  | ●                               | ●                          |   |
| B. Evaluating the need for citizen action   |  | ◎  |                                   | ○                                |   |                                     |   |                                      |  | ◎                               | ●                          |   |
| C. Planning and taking action   |  | ◎  |                                   |                                  |   |                                     |   |                                      |  |                                 | ●                          |   |
| D. Evaluating the results of actions  |  | ◎  |                                   |                                  |   |                                     |   |                                      |  |                                 | ●                          |   |
| <b>STRAND 4—PERSONAL AND CIVIC RESPONSIBILITY</b>   |  |  |                                   |                                  |   |                                     |   |                                      |  |                                 |                            |   |
| A. Understanding societal values and principles   | ◎                                      | ◎  |                                   |                                  | ○   |                                     |   |                                      |  | ○                               | ●                          | ○   |
| B. Recognizing citizens' rights and responsibilities  | ○                                      | ◎  |                                   |                                  | ○   |                                     |   |                                      |  | ○                               | ●                          | ○   |
| C. Recognizing efficacy   | ○                                      | ◎  |                                   |                                  | ○   |                                     |   |                                      |  | ◎                               | ●                          | ○   |
| D. Accepting personal responsibility  |  | ◎  |                                   |                                  | ○   |                                     |   |                                      |  | ○                               | ●                          | ○   |

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|---|--|---|---|---|--|---|---|
| <b>STRAND 1—QUESTIONING AND ANALYSIS SKILLS</b>   |  |   |   |   |  |   |   |
| A. Questioning  | ⊙  |   |   |   | ○  | ⊙   | ○   |
| B. Designing investigations   |  |   |   |   | ○  | ⊙   | ○   |
| C. Collecting information   | ⊙  | ○   |   |   | ○  | ⊙   | ○   |
| D. Evaluating accuracy and reliability  |  |   |   | ●   |  |   |   |
| E. Organizing information   | ○  |   |   |   | ○  | ⊙   | ○   |
| F. Working with models and simulations  | ○  | ○   | ○   |   | ○  | ⊙   |   |
| G. Developing explanations  | ○  | ○   |   |   | ○  | ⊙   |   |
| <b>STRAND 2—KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS</b>  |  |   |   |   |  |   |   |
| <b>2.1—The Earth as a Physical System</b>   |  |   |   |   |  |   |   |
| A. Processes that shape the Earth   |  |   |   |   | ○  | ⊙   |   |
| B. Changes in matter  |  |   |   |   |  |   |   |
| C. Energy   |  |   |   |   |  |   |   |
| <b>2.2—The Living Environment</b>   |  |   |   |   |  |   |   |
| A. Organisms, populations, and communities  | ⊙  |   | ○   |   | ⊙  |   |   |
| B. Heredity and evolution   | ○  |   |   |   | ⊙  | ⊙   |   |
| C. Systems and connections  | ○  |   | ○   |   |  |   |   |
| D. Flow of matter and energy  |  |   |   |   | ○  |   |   |
| <b>2.3—Humans and Their Societies</b>   |  |   |   |   |  |   |   |
| A. Individuals and groups   |  | ○   | ⊙   |   |  |   | ○   |
| B. Culture  |  | ○   | ⊙   |   |  |   | ○   |
| C. Political and economic systems   |  | ⊙   | ⊙   |   |  | ○   |   |
| D. Global connections   |  | ⊙   | ⊙   |   |  |   |   |
| E. Change and conflict  |  | ⊙   | ⊙   |   |  |   |   |
| <b>2.4—Environment and Society</b>  |  |   |   |   |  |   |   |
| A. Human/environment interactions   | ○  | ⊙   | ⊙   |   | ⊙  | ⊙   |   |
| B. Places   |  |   |   |   |  |   |   |
| C. Resources  |  | ○   | ⊙   |   | ○  |   |   |
| D. Technology   |  |   |   |   |  | ●   |   |
| E. Environmental issues   |  | ⊙   | ⊙   |   | ○  | ⊙   | ○   |

| <p><b>Key to Symbols:</b></p> <ul style="list-style-type: none"> <li>● The EE concept is the main focus of the Project WILD activity.</li> <li>◉ The concept is one of the main focuses of the activity; is reinforced.</li> <li>○ The concept is not the main focus of the activity, but it is supported or reinforced.</li> </ul> <p><b>ENVIRONMENTAL EDUCATION GUIDELINES FOR LEARNING, 9–12</b></p> | <p><b>Eat and Glow</b><br/>(gr. 7–10, p. 69)</p> | <p><b>When a Whale Is Right</b><br/>(gr. 9–12, p. 94)</p> | <p><b>Sea Turtles International</b><br/>(gr. 9–12, p. 98)</p> | <p><b>Facts and Falsehoods</b><br/>(gr. 9–12, p. 124)</p> | <p><b>The Glass Menagerie</b><br/>(gr. 9–12, p. 155)</p> | <p><b>Dam Design</b><br/>(gr. 9–12, p. 179)</p> | <p><b>Living Research: ...</b><br/>(gr. 9–12, p. 190)</p> |
|---|--|---|---|---|--|---|---|
| <b>STRAND 3—SKILLS FOR UNDERSTANDING AND ADDRESSING ENVIRONMENTAL ISSUES</b>  |  |   |   |   |  |   |   |
| <b>3.1—Skills for Analyzing and Investigating Environmental Issues</b>  |  |   |   |   |  |   |   |
| A. Identifying and investigating issues   |  | ◉   | ◉   | ○   |  | ◉   |   |
| B. Sorting out the consequences of issues   |  | ◉   | ◉   | ○   |  | ◉   |   |
| C. Identifying and evaluating alternative solutions and courses of action   |  | ◉   | ◉   | ○   |  | ◉   |   |
| D. Working with flexibility, creativity, and openness   |  | ◉   | ◉   | ◉   |  | ◉   |   |
| <b>3.2—Decision-Making and Citizenship Skills</b>   |  |   |   |   |  |   |   |
| A. Forming and evaluating personal views  |  | ◉   | ◉   | ○   |  | ◉   | ○   |
| B. Evaluating the need for citizen action   |  | ◉   | ◉   |   |  |   |   |
| C. Planning and taking action   |  |   |   |   |  |   |   |
| D. Evaluating the results of actions  |  |   |   |   |  |   |   |
| <b>STRAND 4—PERSONAL AND CIVIC RESPONSIBILITY</b>   |  |   |   |   |  |   |   |
| A. Understanding societal values and principles   |  | ◉   | ◉   | ◉   |  |   | ○   |
| B. Recognizing citizens’ rights and responsibilities  |  | ◉   | ◉   |   |  |   | ○   |
| C. Recognizing efficacy   |  | ◉   | ◉   | ◉   |  | ◉   | ◉   |
| D. Accepting personal responsibility  |  | ◉   | ◉   |   |  |   | ◉   |





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