QUICK REFERENCE: 8TH GRADE ENVIRONMENTAL ED.

A. QUESTIONING AND ANALYSIS

Content Standard
Students in Wisconsin will use credible research methods to investigate environmental questions, revise their personal understanding to accommodate new knowledge and perspectives, and be able to communicate this understanding to others.

Rationale:

Developing an understanding of the environment and environmental sustainability depends on students' willingness and ability to ask questions about the world around them, speculate and hypothesize, seek information, and develop answers to their questions. Environmental literacy requires a familiarity with some basic modes of inquiry; a mastery of fundamental skills for gathering, organizing, interpreting, synthesizing, and evaluating information; developing explanations; and communicating these understandings to others.

PERFORMANCE STANDARDS

By the end of grade 8 students will:

A.8.1 Identify environmental issue* questions that can be investigated using resources and equipment available (*see SC Inquiry; LA Research*)

A.8.2 Collect information from a variety of resources, conduct experiments, and develop possible solutions to their investigations*

A.8.3 Use techniques such as modeling and simulating to organize information gathered in their investigations* (*see Mathematics [MA] Process*)

A.8.4 Use critical-thinking strategies to interpret and analyze gathered information (*see SC Inquiry*)

A.8.5 Use the results of their investigations* to develop answers, draw conclusions, and revise their personal understanding

A.8.6 Communicate the results of investigations* by using a variety of media and logically defend their answers (*see LA Writing; Math [MA] Process*)

B. KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS

Content Standard
Students in Wisconsin will demonstrate an understanding of the natural environment and the interrelationships among natural systems.

Rationale:

The foundation of environmental education is a basic understanding of the processes of the interacting systems that comprise the environment. Therefore, it is essential that students have knowledge of the earth as a dynamic, physical, and living system that has been affected over time by various human societies. This knowledge is a necessary prerequisite for problem-solving activities required for individual and community response to environmental issues.

PERFORMANCE STANDARDS

By the end of grade 8 students will:

Energy and Ecosystems

B.8.1 Describe the flow of energy* in a natural and a human-built ecosystem* using the laws of thermodynamics (*see SC Physical Science*)

B.8.2 Explain how change is a natural process, citing examples of succession,* evolution,* and extinction

B.8.3 Explain the importance of biodiversity*

B.8.4 Map the levels of organization of matter; e.g., subatomic particles through biomes (*see SC Physical Science*)

B.8.5 Give examples of human impact on various ecosystems*

B.8.6 Describe major ecosystems* of Wisconsin (*see SC Life and Environmental Science*)

B.8.7 Illustrate the conservation of matter using biogeochemical cycles; e.g., carbon, nitrogen, phosphorous

B.8.8 Explain interactions among organisms or populations of organisms

B.8.9 Explain how the environment is perceived differently by various cultures* (*see SC Nature of Science*)

B.8.10 Explain and cite examples of how humans shape the environment

B.8.11 Describe our society* as an ecosystem*

Natural Resources and Environmental Quality

B.8.12 Provide examples of how different cultures* use natural resources reflecting the economic, aesthetic, and other values* of that culture

B.8.13 Diagram how resources are distributed around the world (*see SC Nature of Science; Social Studies [SS] Political Science and Citizenship: Power, Authority, Governance, and Responsibility*)

B.8.14 Identify the natural resources* that are found in Wisconsin and those that are imported

B.8.15 Analyze how people impact their environment through resource use

B.8.16 Recognize the economic, environmental, and other factors that impact resource availability and explain why certain resources are becoming depleted

B.8.17 Explain how human resource use can impact the environment; e.g., erosion, burning fossil fuels

B.8.18 Identify major air, water, or land pollutants and their sources

B.8.19 Distinguish between point* and nonpoint source* pollution*

B.8.20 Identify types of waste* and methods for waste* reduction (*see SC Earth and Space Science*)

B.8.21 Identify and analyze individual, local, regional, national, and global effects of pollution* on plant, animal, and human health

B.8.22 Identify careers related to natural resources* and environmental concerns (*see SC Applications*)

B.8.23 Identify governmental and private agencies responsible for environmental protection and natural resource* management

B.8.24 Create a timeline of Wisconsin history in resource management (see SC Nature of Science)

C. ENVIRONMENTAL ISSUE INVESTIGATION SKILLS

Content Standard
Students in Wisconsin will be able to identify, investigate, and evaluate environmental problems and issues.

Rationale:

Solving environmental problems and issues requires skills in environmental investigations. These skills, in turn, provide students with opportunities to apply and improve their capacity for systems thinking and their understanding of a sustainable world and society. Focusing on environmental issues offers students a means of integrating their knowledge of human and environmental systems and a way of finding personal relevance in that knowledge.

PERFORMANCE STANDARDS

By the end of grade 8 students will:

C.8.1 Define and provide examples of environmental issues,* explaining the role of beliefs,* attitudes, and values* (*see SS Political Science and Citizenship: Power, Authority, Governance, and Responsibility*)

C.8.2 Use environmental monitoring techniques; such as, observations, chemical analysis, and computer mapping software to collect data about environmental problems* (*see LA Media and Technology; MA Measurement*)

C.8.3 Use questioning and analysis skills to determine beliefs, attitudes, and values held by people involved in an environmental issue

C.8.4 Evaluate the credibility of information, recognizing social, economic, political, environmental, technological, and educational influences (*see LA Writing*)

D. DECISION AND ACTION SKILLS

Content Standard
Students in Wisconsin will use findings from environmental issue investigations to develop decision-making skills, and to gain experience in citizen action skills.

Rationale:

Students need decision-making and action skills to contribute toward environmental sustainability. In addition, these skills enable them to analyze the effectiveness of individual versus group action, develop issue-resolution plans that incorporate one or more citizen participation skills, and consider these plans in terms of social, cultural, and ecological consequences and implications.

PERFORMANCE STANDARDS

By the end of grade 8 students will:

D.8.1 Identify options for addressing an environmental issue* and evaluate the consequences of each option

D.8.2 List the advantages and disadvantages of short-term and long-term solutions to an environmental issue* or problem*

D.8.3 List reasons why an individual or group chooses to participate or not participate in an environmental activity in the home, school, or community

D.8.4 Explain the political, legal, and budgetary options for resolving local, state, and national environmental issues* (see SS Political Science and Citizenship: Power, Authority, Governance, and Responsibility)

D.8.5 Explain how personal actions can impact an environmental issue;* e.g., doing volunteer work in conservation

D.8.6 Develop a plan for improving or maintaining some part of the local environment and identify their role in accomplishing this plan

D.8.7 Identify examples of how personal beliefs* can influence environmental decisions

D.8.8 Give examples of education, economic, and government institutions' influence on an environmental issue,* and the role of citizens* in policy formation (see SS Political Science and Citizenship: Power, Authority, Governance, and Responsibility)

E. PERSONAL AND CIVIC RESPONSIBILITY

Content Standard
Students in Wisconsin will develop an understanding and commitment to environmental stewardship.

Rationale:

Environmentally literate students recognize how their individual behaviors affect the environment. They have the knowledge, skills, and confidence to act on their own about what should be done to maintain an economically and ecologically sustainable environment. They will recognize that their participation in activities can lead to resolution of environmental challenges.

PERFORMANCE STANDARDS

By the end of grade 8 students will:

E.8.1 Formulate a personal plan for environmental stewardship*

E.8.2 Explain the importance of characteristics (such as, trust, patience, self-discipline, respect, and open-mindedness) that enable people to function together to resolve environmental issues*

Glossary of Terms

Audience Appropriate. Materials, ideas, language, etc., being used or presented at a level of understanding.

Belief. Something accepted as true.

Citizen. A person entitled by birth or naturalization to the protection of a given state.

Culture. The totality of socially transmitted behavior patterns, arts, beliefs, institutions, and all other products of human work and thought characteristic of a community or population.

Diversity. Physical or biological complexity of a system. Usually a measure of the number of different species in an ecosystem. (Miller)*

Ecosystems. Self-regulating natural community of plants and animals interacting with one another and with their nonliving environment. (Miller)*

Energy. Ability to do work or produce a change by pushing or pulling some form of matter or to cause a heat transfer between two objects at different temperatures. (Miller)*

Ethic. A principle of right or good conduct; the moral quality of a course of action.

Evolution. The process by which a population of a species changes its characteristics over time in response to changes in environmental conditions. (Miller)*

Habitat. The area or type of environment in which an organism or biological population normally lives or occurs.

Hydrologic Cycle. Biogeochemical cycle that moves and recycles water in various forms through the biosphere. (Miller)*

Inquiry. A close examination of some matter in a quest for information or truth.

Investigation. A process of systematic inquiry.

Issue. A point of discussion, debate, or dispute.

Monitor. To scrutinize or check systematically with a view to collecting certain specified categories of data.

Natural Resource. Anything obtained from the physical environment to meet human needs. (Miller)*

Nonpoint Source. Source of pollution in which wastes are not released at one specific, identifiable point but from a number of points that are spread out and difficult to identify and control. (Miller)*

Nonrenewable. Resource that exists in a fixed amount (stock) in various places in the earth's crust and has the potential for renewal only by geological, physical, and chemical processes taking place over hundreds of millions to billions of years. (Miller)*

Point Source. Source of pollution that involves discharge of pollutants from an identifiable point such as a smokestack or sewage treatment plant. (Miller)*

Pollution. A change in the physical, chemical, or biological characteristics of the air, water, or soil that can affect the health, survival, or activities of human beings or other living organisms in a harmful way. (Miller)*

Problem. A question or situation that presents uncertainty, perplexity, or difficulty.

Renewable. Resource that theoretically can last indefinitely without reducing the available supply, either because it is replaced more rapidly through natural processes than are nonrenewable resources or because it is essentially inexhaustible. (Miller)*

Society. A group of human beings broadly distinguished from other groups by mutual interests, participation in characteristic relationships, shared institutions, and a common culture.

Succession. Process in which communities of plant and animal species are replaced in a particular area over time by a series of different and usually more complex communities. (Miller)*

Sustainability. Ability of a system to survive for some specified (finite) time.

Stewardship. The concept of responsible caretaking, based upon the premise that we do not own resources but are managers of resources, and are responsible to future generations for their condition.

Value. A principle, standard, or quality considered worthwhile or desirable.

Waste. Useless, unneeded, discarded, unused or excess material such as ashes, garbage, by-products.

*_Environmental Science: Working with the Earth._ 7th edition. G. Tyler Miller, Jr. Wadsworth Publishing Co. c1999.