

# Environmental Science

## [27.180]

In addition to the standards for all science teachers that are set forth in Section 276.140 of this Part, those who specialize in the teaching of environmental science shall be required to meet the standards described in this Section.

### STANDARD 1

**The competent environmental science teacher understands the Earth as a physical system, the living environment, humans and their societies, and human-environment interactions**

**Knowledge Indicators** - *The competent environmental science teacher:*

- 1A. understands the cycling of matter and flow of energy through the biotic and abiotic components of various ecosystems.
- 1B. understands the interactions and interdependence of Earth's biotic and abiotic systems.
- 1C. understands how the complex relationships of social, cultural, political, and economic systems impact local, regional, and global environments.
- 1D. understands the ecological implications of human activities and communities.

**Performance Indicators** - *The competent environmental science teacher:*

- 1E. describes how the laws of thermodynamics apply to habitats, individual organisms, and community dynamics.
- 1F. analyzes carbon dioxide/oxygen, hydrologic, and nitrogen cycles, and their effects at local, regional, and global levels.
- 1G. compares and contrasts biotic and abiotic factors in the environment and describes the interrelatedness of organisms to each other and to their environment.
- 1H. analyzes how carrying capacity, population dynamics, principles of natural selection, and human activity determine the biodiversity and distribution of organisms in various environments.
- 1I. makes inferences about population sizes using sampling techniques.
- 1J. analyzes how economic, political, cultural, and social processes interact to shape environmental issues.
- 1K. analyzes the ways in which the environment has been changed by natural occurrences and human intervention, differentiating between short- and long-term effects.

### STANDARD 2

**The competent environmental science teacher has an understanding of environmental issues and possesses the skills to address these issues.**

**Knowledge Indicators** - *The competent environmental science teacher:*

- 2A. understands the steps involved in conducting investigations of environmental issues in a social and political context.
- 2B. understands the societal, economic, and cultural influences on the environmental decision-making process.

- 2C. understands internationally accepted positions regarding citizens' environmental rights and responsibilities and the historical basis for their development.
- 2D. understands trends in national and global societies that relate to environmental quality.
- 2E. understands the connection between environmental awareness and environmental decision-making and action.

**Performance Indicators - *The competent environmental science teacher:***

- 2F. evaluates the validity of information sources related to environmental issues by identifying bias and boundaries of evidence.
- 2G. applies research and analytical skills necessary for the investigation of local, regional, and global environmental issues.
- 2H. identifies and evaluates differing interpretations of environmental issues and alternative ways to consider their cultural and ecological impacts.
- 2I. guides students to develop abilities to identify, evaluate, and clarify their own values and positions related to discrete environmental issues and their associated solutions.
- 2J. evaluates proposed or implemented citizen actions with respect to their influence on achieving and/or maintaining a dynamic equilibrium between quality of life and quality of the environment.

### **STANDARD 3**

**The competent environmental science teacher understands and can apply scientific processes and concepts to the study of environmental phenomena.**

**Knowledge Indicators - *The competent environmental science teacher:***

- 3A. understands the strategies and research bases to propose, analyze, and evaluate environmental studies as a form of scientific inquiry.
- 3B. understands established criteria used to evaluate sources of environmental information and educational materials.
- 3C. understands Illinois, United States, and world environmental history.
- 3D. understands the actual and potential impact of local, State, national, and global policies on environmental issues.

**Performance Indicators - *The competent environmental science teacher:***

- 3E. develops, modifies, clarifies, and explains questions that guide explorations of environmental phenomena of various types.
- 3F. designs safe and appropriate field and classroom studies for community-based action research investigations.
- 3G. creates, uses, and evaluates algebraic, geometric, and computer models and simulations to understand environmental phenomena.
- 3H. uses the equipment and technologies necessary to conduct safe and appropriate studies of environmental phenomena.
- 3I. uses national, State, and local criteria to evaluate and select environmental education materials.
- 3J. evaluates degrees of bias in claims derived from scientific studies used in advertising and marketing strategies.
- 3K. compares and contrasts how individuals, and governments contend with the prevention and correction of health-threatening environmental problems.