

## **Possible Next Generation Science Standards**

### **Earth Science**

HS-ESS2-5. Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.

HS-ESS2-6. Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.

HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

HS-ESS3-3. Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.

HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

### **Life Science**

HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.

HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

HS-LS2-3. Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.

HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

### **Engineering Design**

HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

### **Crosscutting Concepts**

### Systems and System Models

Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions— including energy, matter, and information flows— within and between systems at different scales. (HS-ETS1-4)

### Stability and Change

Change and rates of change can be quantified and modeled over very short or very long periods of time. Some system changes are irreversible. (HS-ESS3-3),(HS-ESS3-5)  
Feedback (negative or positive) can stabilize or destabilize a system. (HS-ESS3-4)

### Cause and Effect

Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects. (HS-ESS3-1)

### Energy and Matter

The total amount of energy and matter in closed systems is conserved. (HS-ESS2-6)  
Energy drives the cycling of matter within and between systems. (HS-ESS2-3)

### Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials. (HS-ESS2-5)

## Wisconsin Social Studies Standards

### Geography

A.12.4 Analyze the short-term and long-term effects that major changes in population in various parts of the world have had or might have on the environment

A.12.6 Collect and analyze geographic information to examine the effects that a geographic or environmental change in one part of the world, such as volcanic activity, river diversion, ozone depletion, air pollution, deforestation, or desertification, may have on other parts of the world

A.12.7 Collect relevant data to analyze the distribution of products among global markets and the movement of people among regions of the world

A.12.8 Identify the world's major ecosystems and analyze how different economic, social, political, religious, and cultural systems have adapted to them

A.12.9 Identify and analyze cultural factors, such as human needs, values, ideals, and public policies, that influence the design of places, such as an urban center, an industrial park, a public project, or a planned neighborhood

A.12.10 Analyze the effect of cultural ethics and values in various parts of the world on scientific and technological development

### **Urban Citizenship**

C.12.1 Identify the sources, evaluate the justification, and analyze the implications of certain rights and responsibilities of citizens

C.12.5 Analyze different theories of how governmental powers might be used to help promote or hinder liberty, equality, and justice, and develop a reasoned conclusion

C.12.8 Locate, organize, analyze, and use information from various sources to understand an issue of public concern, take a position, and communicate the position

C.12.9 Identify and evaluate the means through which advocates influence public policy

C.12.10 Identify ways people may participate effectively in community affairs and the political process

C.12.11 Evaluate the ways in which public opinion can be used to influence and shape public policy

C.12.14 Explain and analyze how different political and social movements have sought to mobilize public opinion and obtain governmental support in order to achieve their goals

### Language Arts

Presentation of Knowledge and Ideas 1: Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.

Presentation of Knowledge and Ideas 2: Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

Language: Knowledge of Language: Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

## **Great Lakes Principles**

Principle 1: The Great Lakes, bodies of fresh water with many features, are connected to each other and to the world ocean.

Principle 2: Natural forces formed the Great Lakes; the lakes continue to shape the features of their watershed.

Principle 3: The Great Lakes influence local and regional weather and climate.

Principle 4: Water makes Earth habitable; fresh water sustains life on land.

Principle 5: The Great Lakes support a broad diversity of life and ecosystems.

Principle 6: The Great Lakes and humans in their watersheds are inextricably interconnected

Principle 7: Much remains to be learned about the Great Lakes.

Principle 8: The Great Lakes are socially, economically, and environmentally significant to the region, the nation and the planet.