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# Standards Correlations

## Rock Cycle 3rd - 12th

### Program Synopsis

Dig into northeastern Indiana's rich geological history! Students discover the impact glaciers had on this area by seeing glacial activity up close. Hike down an esker, move through layers of topsoil and glacial till to find a peat bog, explore and identify rocks in an abandoned gravel pit, and use models to understand how glaciers changed Indiana's landscape.

### Indiana Academic Standards for Science

#### 3rd Grade

- 3.ESS.3** | Observe the detailed characteristics of rocks and minerals. Identify and classify rocks as being composed of different combinations of minerals.
- 3.ESS.4** | Determine how fossils are formed, discovered, layered over time, and used to provide evidence of the organisms and the environments in which they lived long ago.

#### 4th Grade

- 4.ESS.2** | Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
- 4.ESS.3** | Describe how geological forces change the shape of the land suddenly and over time.
- 4.ESS.4** | Develop solutions that could be implemented to reduce the impact of humans on the natural environment and the natural environment on humans.

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## 7th Grade

- 7.PS.7** | Construct a device that uses one or more of Newton's laws of motion. Explain how motion, acceleration, force, and mass are affecting the device.
- 7.ESS.1** | Identify and investigate the properties of minerals. Identify and classify a variety of rocks based on physical characteristics from their origin, and explain how they are related using the rock cycle. (i.e. Sedimentary, igneous, and metamorphic rocks)
- 7.ESS.4** | Construct an explanation, based on evidence found in and around Indiana, for how large scale physical processes, such as Karst topography and glaciation, have shaped the land.
- 7.ESS.7** | Describe the positive and negative environmental impacts of obtaining and utilizing various renewable and nonrenewable energy resources in Indiana. Determine which energy resources are the most beneficial and efficient.

## 9th - 12th Grade Earth and Space Science

- ES.3.4** | Evaluate the use of sustainable versus nonrenewable resources. Explain the consequences of overuse and continued increased consumption of limited resources. Analyze and evaluate the benefits of researching, designing, and developing sustainable resources for private use and industry.
- ES.5.2** | Create a rock cycle flowchart or diagram that demonstrates the processes involved in the formation, breakdown, and reformation of igneous, sedimentary, and metamorphic rock. Show how each type can melt and reform igneous rock, undergo the various metamorphic processes, and undergo physical and chemical weathering to form sedimentary rock.
- ES.5.5** | Create a timeline detailing the processes that have occurred in Indiana to create mostly sedimentary bedrock. Explain how changing sea levels, climate, and glaciation have shaped Indiana geology.

## 9th - 12th Grade Environmental Science

- Env.2.7** | Differentiate between renewable and nonrenewable resources, and compare and contrast the pros and cons of using nonrenewable resources.
- Env.2.11** | Recognize and describe the role of natural resources in providing the raw materials for an industrial society.
- Env.8.3** | Recognize and explain that in evolutionary change, the present arises from the materials of the past and in ways that can be explained, such as the formation of soil from rocks and dead organic matter.

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## **Indiana Environmental Literacy Guidelines**

**for up to 4th Grade**

### **Questioning, Analysis and Interpretation**

Design simple investigations for both classroom and outdoor settings to help answer their questions. Their investigations will include making predictions, developing a hypothesis, making observations and drawing conclusions.

Locate and collect information about the environment and environmental topics by using tools, maps, technology and basic field skills (observing, interviewing, measuring).

Use models to demonstrate relationships, patterns, and processes.

### **Knowledge of Environmental Process and Systems**

List sources of energy, and be able to tell the difference between renewable and non-renewable sources.

Describe and give examples of natural resources; e.g., water, minerals, soils, air, etc.

### **Skills for Understanding and Addressing Environmental Issues**

Apply knowledge from the past, present and of future trends to understand and address local environmental problems and issues. For example, describe what has changed, is changing and could change to predict future issues and potential solutions.

Identify some of the decisions and actions related to an issue and explain why those decisions and actions occurred.

Describe how their own actions and those of others have affected an issue.

### **Personal and Community Action**

Understand how their civic responsibilities promote personal actions that support their environment.

Connect with their local environment through a variety of positive outdoor experiences.





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## Indiana Environmental Literacy Guidelines

for up to 12th Grade

### Questioning, Analysis and Interpretation

Develop, modify, clarify, and explain questions about important environmental issues, and describe why and how they arrived at those questions.

Identify specific environmental questions, problems, or situations related to local, national and global environmental issues.

Design focused environmental investigations using appropriate measurements, observations and tools.

### Knowledge of Environmental Process and Systems

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

Identify and evaluate multiple uses of natural resources and how society is influenced by the availability of these resources.

Explain how humans' use of our resources can impact the environment and deplete resources.

### Skills for Understanding and Addressing Environmental Issues

Define and clearly articulate environmental issues, taking into consideration connections to other issues, how widespread its effects are, and whether it is unique to a particular area.

Compare the effects of natural and human-caused activities that contribute to or challenge an ecologically and economically sustainable environment.

Use questioning and analysis skills to understand the beliefs, attitudes, and values held by people involved in an environmental issue.

### Personal and Community Action

Explain how characteristics such as trust, patience, self-discipline, respect and open-mindedness help people function together to resolve environmental issues. Practice exhibiting these important characteristics in addressing a variety of environmental issues.

Articulate their personal beliefs regarding their relationship to the environment and how they arrived there by citing personal experiences, alternative viewpoints, and the research of scientifically-relevant sources.

Expand their personal connections with their local environment.

Document prepared by Merry Lea according to current [Indiana Academic Standards](#) from the Indiana Department of Education website and according to [Indiana Environmental Literacy Guidelines](#) from the Environmental Education Association of Indiana.