Science & Environmental Education:
Community Connections, Impacts & Actions

6th - 8th Grade Curriculum
Environmental education is a lifelong learning process that leads to an informed and involved citizenry having the creative problem-solving skills, scientific and social literacy, ethical awareness and sensitivity for the relationship between humans and the environment, and commitment to engage in responsible individual and cooperative actions.

By these actions, environmentally literate citizens will help ensure an ecologically and economically sustainable environment.
ESSENTIAL QUESTION:
What creates colors in nature and why are they important?

Colors In Nature

NGSS Performance Expectations: **MS PS 4**
Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

Wisconsin Environmental Education Standard ELS.EX2:
Students in Wisconsin will be able to evaluate relationships and structures of natural and cultural systems and analyze their interdependence.

**Location:** Retzer Nature Center
**Number of Students:** 25-100
**Description:**
Students will participate in a *Color Scavenger Hunt* related to pollinators/bees and other important colors in nature (eg. why is the sky blue, why is the grass green?) and view the planetarium show *Cosmic Colors: An Adventure Along the Spectrum.*

CALL TO ACTION:
**Build a school butterfly garden!**

[Lesson Plan]
[Program Request]
Plant and Animal Communication

NGSS Performance Expectations: MS PS 1
Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

Wisconsin Environmental Education standard ELS.C1:
Students in Wisconsin will be able to evaluate relationships and structures of natural and cultural systems and analyze their interdependence.

Location: EB Shurts Environmental Education Center
Number of Students: 50-100
Description:
Students will rotate through three stations as they explore different ways plants and animals use scent to communicate. Activities include predator-prey games, setting up a long-term research project, and investigating how to increase distance scent travels.

Lesson Plan
Program Request

CALL TO ACTION:
Build a school butterfly garden!
Effects of Water on The Land

NGSS Performance Expectations: MS ES 2
Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.

Wisconsin Environmental Education standard ELS.EX2: Students in Wisconsin will be able to analyze the interactions and outcomes of cycles and flows in natural and cultural systems.

Location: Lapham Peak at Kettle Moraine State Forest
Number of Students: 50-120

Description:
Students will observe how water has shaped our local landscape through glaciers and rivers. They will measure and map kettles, climb the Lapham Tower, and utilize stream tables to make predictions.

ESSENTIAL QUESTION: How does water shape the earth?

CALL TO ACTION:
Observe the topography of the area in relation to local rivers and lakes and determine how the watershed is affected by the local topography.

Lesson Plan
Program Request
Invasive Species Study

**ESSENTIAL QUESTION:**
How have invasive species influenced native plant and animal populations?

**NGSS Performance Expectations:** MS LS 2
Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

**Wisconsin Environmental Education standard ELS.EX2:**
Students in Wisconsin will be able to analyze the dynamic balance between natural and cultural systems.

**Location:** EB Shurts Environmental Education Center or Prairie Springs Environmental Education Center

**Number of Students:** 25-100

**Description:**
Students will participate in an Invasive Species Pull where they are actively engaged in battling an invasive species in our community. They will also take part in water quality to determine how biotic and abiotic factors can be affected by invasive species.

**CALL TO ACTION:**
Students will work to research species, policies and current management practices, then formulate a management plan for invasive species prevention.

[Lesson Plan]

[Program Request]
**Weather & the River**

**ESSENTIAL QUESTION:**
How does weather affect the water in the Fox River?

**NGSS Performance Expectations:** MS ES 2
Develop a model to describe the cycling of water through Earth’s systems driven by energy from the sun and the force of gravity.

**Wisconsin Environmental Education standard ELS.EX2:**
Students in Wisconsin will investigate and analyze how change and adaptation impact natural and cultural systems.

**Location:** EB Shurts Environmental Education Center

**Number of Students:** 25-100

**Description:**
Students will investigate the effects of weather (specifically precipitation) on the local portion of the Fox River as well as make predictions using stream models.

**CALL TO ACTION:**
[Design and install a rain garden](#) for your school.
Recycling

NGSS Performance Expectations: **MS ES 2**
Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process.

**Wisconsin Environmental Education standard ELS.EX5:**
Students in Wisconsin will investigate and analyze how change and adaptation impact natural and cultural systems.

**Location:** Materials Recycling Facility - Milwaukee
(Booked via Waukesha County Recycling)

**Number of Students:** 15-40

**Description:**
Students will tour the Milwaukee Materials Recycling Facility (MRF) and observe the fascinating combination of physics, technology and people sorting and baling mixed recyclables before heading to market. They will learn what can be recycled, why some things cannot be recycled, and what recyclables become.

**ESSENTIAL QUESTION:**
How can we reduce the impact of our consumer waste on the environment?

**CALL TO ACTION:**
Have students work on improving the current recycling program at school or begin a food waste reduction/food recovery program or composting program.

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**Lesson Plan**  
**Program Request**
ESSENTIAL QUESTION: How do adaptations help organisms survive in the prairie?

Survival in the Prairie

NGSS Performance Expectations: MS LS 2
Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

Wisconsin Environmental Education standard ELS.EX2: Students in Wisconsin will assess how diversity influences health and resilience of natural and cultural systems.

Location: Retzer Nature Center
Number of Students: 25-100
Description:
Students will observe the differences in four distinct ecosystems (prairie, old field, pine plantation, and forest) and make connections to the adaptations that have taken place over time.

CALL TO ACTION:
Students will gather information about how humans have influenced the inheritance of desired traits in plants and animals through artificial selection. Students synthesize the information use it to identify and describe how artificial selection has led to advances in technology.

Lesson Plan
Program Request
ESSENTIAL QUESTION:
How can we utilize environmentally-friendly materials in our winter sporting and daily activities?

The Big Melt

NGSS Performance Expectations: **MS PS 1**
Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

**Wisconsin Environmental Education standard ELS.C1:**
Students in Wisconsin will be able to identify, investigate, and evaluate environmental problems and issues.

**Location:** EB Shurts Environmental Education Center
**Number of Students:** 25-150

**Description:**
Students will build awareness and appreciation of the local environment in the winter, as well as an opportunity to investigate how we can be aware of our environment while solving a common winter issue: ice.

**CALL TO ACTION:**
Students will work in groups to propose more environmentally friendly solutions to their school to help reduce ice on the sidewalks.

[Lesson Plan] [Program Request]
Amazing Renewable Energy

NGSS Performance Expectations: **MS PS.3**
Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.

**Wisconsin Environmental Education standard ELS.EX5:**
Students in Wisconsin will analyze the dynamic balance between natural and cultural systems.

**Location:** Retzer Nature Center
**Number of Students:** 25-150

**Description:**
Students will have the opportunity to learn how we can utilize alternative energy sources to minimize environmental impact. Students will rotate through four distinct stations, including a spectacular planetarium show.

**ESSENTIAL QUESTION:**
How can we minimize negative environmental impact using alternative forms of energy?

**CALL TO ACTION:**
Students will collaboratively create a **School and Home Energy Plan** to lower the environmental impact of energy use at their school and educate the members of the school community.

**Lesson Plan**

**Program Request**
ESSENTIAL QUESTION:
What environmental factors have affected the growth of macroinvertebrates in the Fox River and Genesee Creek?

Water Comparisons

NGSS Performance Expectations: MS LS 1
Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

Wisconsin Environmental Education standard ELS.EN7:
Students in Wisconsin will evaluate relationships and structures of natural and cultural systems and analyze their interdependence and be able to communicate this understanding to others.

Location: EB Shurts Environmental Education Center & Prairie Springs Environmental Education Center

Number of Students: 25-100

Description:
Students will have the opportunity to test the biological, physical, and chemical characteristics of the Fox River (EB Shurts) and Genesee Creek (Prairie Springs) and make inferences as to how those environmental factors relate to water quality.

CALL TO ACTION:
Students will mark storm drains with the message, “Dump no Waste, Drains to River”. Supplies are available for this activity.

Lesson Plan
Program Request
ESSENTIAL QUESTION: How have natural and human influences caused the forests of Wisconsin to change over time?

How is the Forest Changing?

NGSS Performance Expectations: MS ES 2
Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.

Wisconsin Environmental Education standard ELS.EX2: Students in Wisconsin will evaluate relationships and structures of natural and cultural systems and analyze their interdependence.

Location: EB Shurts Environmental Education Center
Number of Students: 25-100
Description: Students will participate in a tree identification and mapping activity, and learn about how forests change due to natural and human influences.

CALL TO ACTION: Plan and implement an Arbor Day celebration for the school and/or community.

Lesson Plan
Program Request
ESSENTIAL QUESTION:
What specialized structures do aquatic macroinvertebrates have that help them survive and reproduce?

Aquatic Survival

NGSS Performance Expectations: MS LS 1
Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

Wisconsin Environmental Education standard ELS.EN7:
Students in Wisconsin will evaluate relationships and structures of natural and cultural systems and analyze their interdependence.

Location: EB Shurts Environmental Education Center

Number of Students: 25-100

Description:
Students will investigate how the plants and animals of the Fox River respond to different conditions and how they are specifically adapted for survival.

CALL TO ACTION:
Students will mark storm drains with the message, “Dump no Waste, Drains to River”. Supplies are available for this activity.
Team Building

Wisconsin Environmental Education standard:
Students in Wisconsin will develop an understanding and commitment to environmental stewardship.

Location: EB Shurts Environmental Education Center

Number of Students: 25-100

Description:
This field experience is designed to last a half day. Students will take part in an “Amazing Race” style hunt where they work together as a team to save the world as well as partake in traditional team building activities. Want to make it a full day of fun? Add on a third station from one of our other standards-based field experiences.

ESSENTIAL QUESTION:
How do we work more effectively as a team?

Lesson Plan  Program Request
Retzer Nature Center is over 450 acres of prairie, forest, wildlife habitat, nature trails and environmental learning facilities in Waukesha County. The state-of-the-art, 90-seat, Digistar-6 planetarium is owned and operated by the School District of Waukesha.
Carroll University's Prairie Springs Environmental Education Center and Greene Field Station are located in the Town of Genesee, about 10 miles from the University's main campus in Waukesha. The site includes a stunning new facility for teaching and research—as well as 75 acres of natural springs, wetlands, woodlands and grasslands along Genesee Creek.
The E.B. Shurts building, located in the Fox River Sanctuary, is home to the environmental education program of the School District of Waukesha. The building is operated through a cooperative agreement between the School District of Waukesha and the City of Waukesha, Park and Recreation Department.
Waukesha County, Waukesha School District, and Carroll University have collaborated to create a comprehensive, interdisciplinary K-12 science and environmental education curriculum fully integrated with NGSS Science and Literacy standards.

The goal of this curriculum is to create more scientifically and environmentally literate citizens with the ability to understand and critically assess current scientific and environmental issues, along with a desire and ability to engage in these issues. This project focuses on improving efficiencies through program coordination among partners as well as building comprehensive approaches.