Exploring the Natural World

The natural world is full of wonders to behold! It encompasses all living and non-living things occurring naturally. The complex nature of plant and animal life is of great interest to many, especially people who wonder about and closely observe their surroundings. There are those who specialize in the natural sciences. Botanists study plant science. Biologists are interested in life and living organisms. Ecologists study the interaction between living organisms and their environment. Geologists are fascinated by the structure of the Earth beneath the surface. They examine the rocks that make up the Earth’s composition, and the processes by which they change over time. Additionally, visual artists often look to the natural world as a source of inspiration.

Whether you choose to focus on one particular area, or simply take in the unexpected beauty that can be found in the park, we invite you to explore the natural world. As you hike the Michigan Legacy Art Park trails and enjoy the trails that wind through the woods, think about the works of art that you encounter. Consider how they reflect, and blend into, nature. Take time to stop often. Look, listen, and breathe in the natural wonders that surround you. Be sure to invite conversations by posing questions that are provided in this educational booklet. These initial questions may serve as a launch to a unit of study, as an ongoing inquiry while visiting the park, or as a means of informal assessment at the end of a unit.

- What makes a place natural?
- What resources does the natural world provide?
- What can we learn from nature?

The conversations that these questions elicit will lead to a greater understanding of the scientific and philosophic concepts explored here. The questions are designed to support critical thinking skills by having students draw analogies between the sculptures and the concepts presented. In addition, while discussing the sculptures, your students will develop more of an appreciation for the creative processes that visual artists use to communicate messages.

“Walking makes the world much bigger and thus more interesting. You have time to observe the details.”

—Edward Abbey

**Art Vocabulary**

Because the collection of Michigan Legacy Art Park consists of outdoor sculpture, it may be helpful to familiarize students with the following art vocabulary prior to your visit.

**BALANCE**

The equal “visual weight” of shapes, lines, color, texture or space on both sides of an imaginary center line in a work of art.

**FORM**

The three-dimensional area of an object. An object that has height, width, and depth is three-dimensional, and can be walked around on all sides.

**LINE**

An element used to define a shape and show the edges of an object. A line is a path made by a moving point.

**ORGANIC SHAPES**

A shape is a two-dimensional area with height and width. Organic is a term used to describe curving or naturally occurring shapes, such as those found in nature.

**REPETITION**

When one or more of the elements of art, such as lines, shapes, or colors, occur several times within a work of art. If an element is repeated consistently in the work, it creates a pattern.

**RHYTHM**

The illusion of motion or movement created by repeating elements, such as lines or shapes, in a work of art.

**TEXTURE**

The way a surface feels or looks like it feels. It can be real (tactile) or implied (visual). A few examples are: smooth, rough, shiny, dull, bumpy.

**SYMBOL**

Something that represents something else by association, resemblance, or convention. An object used to represent something invisible.

**Science Vocabulary**

The sculptures featured in this educational booklet focus on the natural world. Therefore, it may be helpful to familiarize students with the following physical science vocabulary prior to your Michigan Legacy Art Park visit.

**BATHYMETRY**

The study of underwater depth of lake or ocean floors; the underwater equivalent to topography. They typically show seafloor relief or terrain as contour lines. The name comes from the Greek words bathus, meaning “deep,” and metron, meaning “measure.” Bathymetric charts and maps are typically created to support safety of surface or sub-surface navigation.

**BIODIVERSITY**

This term refers to the rich variety of plant and animal life that exists on our planet.

**ECOSYSTEM**

A biological community made up of living organisms and their surrounding environment. All of the plants, animals, and type of terrain in any area.

**ENVIRONMENT**

Natural surroundings in which humans, animals, and plants develop and grow during their lives.

**HABITAT**

A type of natural environment in which a particular species of organism lives. It is characterized by both physical and biological features. A species’ habitat is those places where it can find food, shelter, protection, and mates for reproduction.

**HUMAN-ENVIRONMENT GEOGRAPHY**

The branch of geography that describes and explains aspects of interactions between humans or societies and their natural environment.

**LAKE**

A large body of water enclosed on all sides by land and fed by rivers and streams. All of Michigan’s lakes are fresh water, although some lakes are salt water.

**RIVER**

A long and winding (meandering) body of fresh water that erodes and shapes the land. The sediments that rivers transport end up in lakes or oceans.
KEY IDEAS
• Frogs are amphibians that can be found in various biomes around the world.
• They are sensitive and dependent on specific ecosystems.
• Their origins can be traced back millions of years, but frog populations have declined significantly since the 1950s.
• More than one third of frog species are considered to be threatened with extinction.

INSPIRATION
There are few places on earth with more area where land and water meet than Michigan. Here the bogs and marshes, ponds, lakes, streams and rivers provide a niche for life. Frogs can warn us well in advance of potential danger to our environment, so we can act to preserve this special place. Artist Bill Allen believes “that frogs embody the spirit of transformation and survival that we in northern Michigan possess, with their unique progression from tadpole to full-grown frog.” This sculpture was inspired in the fragile habitats where frogs live. Allen said, “I have chosen to sculpt a frog because I believe they represent some of northern Michigan’s most unique and special gifts. They are the harbingers of spring,” with each species adding to the chorus.

BACKGROUND
Bill Allen’s art is inspired by his deep affection for nature. Some of his public work can be viewed at zoos, museums of natural history, and nature centers across the country. Frog is made of galvanized steel and coated with copper, then painted with the rich colors of a Michigan frog.

DISCUSSION QUESTIONS
• What words might you use to describe the texture of Frog?
• What materials did the sculptor use? What is the overall effect?
• What lines, shapes, and patterns do you see in this sculpture?
• Do animals have characteristics that people don’t have? Name some.
• If you could have a characteristic of a frog what would you choose? Why?
• What animal reminds you of yourself? What makes you say that?
KEY IDEAS
• When early settlers ventured into the territories of present day Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, and Missouri, they found thousands of mounds built by the first people to inhabit the land.
• Some of the mounds were in the shape of birds, reptiles, and fabulous beasts.
• Archaeologists have unearthed bones, pottery, ceremonial tools, exotic carvings, and weapons from the mounds.

INSPIRATION
Serpent Mound evokes another time and place, of centuries past. Patricia Innis’ one-hundred and twenty-foot long earthen sculpture, winding its way through the woods, is reminiscent of the ancient mound-builders who lived throughout the Ohio and Mississippi River Valleys. The people who built the mounds were called the Yam-Ko-Desh, meaning “prairie people.” As Europeans settled in the Midwest, they were fascinated by the mounds scattered throughout Michigan and beyond. Archaeologists have determined the mounds to be burial sites after finding skeletons, arrow and spear heads, stone tools, pottery vessels and more. As well as embodying the Yam-Ko-Desh culture, the serpent also represents the numerous types of snakes inhabiting Michigan. In many cultures, the snake was revered and viewed as a symbol of rebirth because of its ability to shed its skin.

BACKGROUND
Patricia Innis’ installation references ancient history and reminds us of the importance of honoring the past. Both the serpent and the egg are formed from sand and topsoil. Native grasses will blanket the serpent, while moss grows on the egg. Small ceramic effigies (figures) representing “wishes for the world,” were created by area school children, and are buried along the perimeter of the serpent.

DISCUSSION QUESTIONS
• What is the first thing your eyes see when you look at this sculpture?
• What shapes do you see? What textures do you see?
• In what ways is this sculpture both a work of art and a result of the natural world?
• What can people learn by studying cultures of the past?
• Why is it important to honor the past?
• How can people of today honor the past?

KEY IDEAS
• Landscapes are subject to the processes of erosion and uplift, deposition, depression, and shifts in the ground.
• Finding places in the natural world that invite us to be still and in-tune with our true nature are a treasure.

INSPIRATION
Satisfaction from Nature encourages one to stop, have a seat, and take in the beauty of the forest. In framing the real forest, the artist also suggests a framed piece of artwork. Consider how art and nature mirror one another. Both stimulate a variety of responses that reflect the experience of the viewer. Indulge your creative spirit. Move around so the view you see through the frame changes. Find your perspective and, in it, your work of art.

Of Satisfaction from Nature, David Barr wrote, “Perched on the crest of a forest glade, this sculpture provides a witty framing of a natural vista. The viewer is cleverly focused on an infinitely and subtly changing panorama of dappled light, vegetation, butterflies, and seasons... nothing stays fixed in time.”

BACKGROUND
Byung Chan Cha was the first student from the Interlochen Arts Academy (IAA) to create a sculpture for Michigan Legacy Art Park. This work, created in 2001, represents the partnership between the two institutions, which provides sculpture students experience with professional artists.

DISCUSSION QUESTIONS
• How does this work of art invite you in?
• Why do you suppose it is located where it is? Why does the artist’s choice of location matter?
• Once students have a seat on the bench, ask sensory questions: What do you see? What sounds do you hear?
• What emotions do you feel as you sit and take in the beauty of natural world?
• Take a look at the title of this work of art. Does knowing the title change your understanding of this piece? Does knowing the title of a work of art limit your understanding, or focus it?
• Do you have a favorite season that draws you into nature and invites you to sit a spell? What is it?
KEY IDEAS
- This installation, a set of stone mysteries, is about cycles found in the natural world.
- All things are connected. All places are connected. Humans need to be good stewards in caring for the natural world.

INSPIRATION
As an artist, David Barr's goal was always to transform ideas into new, visible expressions. And that is what he has done in Nurture/Nature. This sculpture is a metaphor for the fragility of the natural world. Barr devoted much of his life to studying nature's cycle of growth, decay and regeneration. The knowledge and understanding he gained from observing this process allowed him to creating works of art that reflect his experiences. Of this sculpture, Barr wrote, "Without caring for the egg, there is no bird. In art history, the egg is a timeless and universal symbol of life. From prehistory on, choosing to carve in the hardness of granite conveys reverence for form."

BACKGROUND
David Barr believed that the space around a sculpture is very important, so many of his works are exhibited in large outdoor venues. "When I look at nature, if I look at a flower or a tree or anything else, I see a color and I see a form and they are revealed to me through light and space and time. Those elements are present in everything I do: the actualities of those elements."

DISCUSSION QUESTIONS
- What forms do you see when looking at this sculpture?
- What might the stones represent? The "egg"?
- What might the sculpture symbolize?
- The title of this sculpture is Nurture/Nature. Why do you think the artist called it that?
- In what ways does the environment nurture people? What are some ways that individuals can nurture the environment?
- With a partner, come up with an analogy between this work of art and something else. (An analogy is like a metaphor. It compares one thing to another, providing clarity or identifying hidden similarities between two ideas.)
**KEY IDEAS**

- Contour lines are used to show elevations in topographic maps.
- A place’s history is decided by its geography.

**INSPIRATION**

All maps are an abstraction, meaning that they are a simplification of the reality being mapped. Most of the information from the natural world is removed, until the object remaining is on the edge of being unrecognizable, focusing the attention of the viewer on what the cartographer, or map maker, believes is essential. *Michigan* is a bathymetric map of Lake Michigan, which means it is an underwater topographic map. When a viewer stands on the shore of Lake Michigan and looks out over the lake, it appears infinite and powerful. When viewed from an aerial perspective, looking down at the Earth, the same lake seems small and fragile. This sculptural representation of Lake Michigan speaks of the finite, fragile nature of the lake and invites its viewers to consider what lies beneath the water’s surface. It also serves as a reminder that every person has a responsibility to be good stewards of the environment.

**BACKGROUND**

Brian Ferriby’s sculptures allow him to combine his passions for architecture, music, and the environment. As can be seen in *Michigan*, the artist embraces space and form like architecture, movement and rhythm like music, and beauty and simplicity like nature. Ferriby has chosen to work in steel and copper, acknowledging the mining industry of Michigan’s Upper Peninsula.

**DISCUSSION QUESTIONS**

- What perspective did the sculptor use when creating this piece?
- How does the viewing experience change when standing in different places around the sculpture?
- In your opinion, would this sculpture be as effective if it were presented horizontally, rather than vertically? Why or why not?
- How does this sculpture capture the rhythm and movement that can be found when observing Lake Michigan?
- Why might the artist have chosen to portray Lake Michigan as a bathymetric map? What effect does it have on the viewer?
- How is the material the sculptor chose a symbol for the subject matter?
Have some fun with language! Use the sculptures featured in this booklet, or others you find on the trail, as your inspiration.

Choose a work of art that interests you as the subject of a poem. Think of words that are related to this sculpture and make a Word List. Next, circle the words that you think will be most effective to use in your poem.

**CREATE A CINQUAIN POEM**

A cinquain is a short poem with a structure of five lines and eleven words. The lines are set out like this:

Line 1. Subject - one word
Line 2. Description - two words
Line 3: Action - three words
Line 4: Feeling - four words
Line 5: Re-name subject - one word

**CREATE SOME ANALOGIES**

An analogy is a comparison of two things. As you hike the trails, or back in the classroom, create analogies based on an identified relationship using two words as a starting point. Here are a few examples using art and nature words as starting points.

- Part to Whole: Finger is to hand as petal is to flower.
- Worker and Product: Painter is to portraits as writer is to books.

**TEACHER NOTE**

Prepare ahead of time: Create index cards, each with a grade-appropriate word relating to either art, nature, or science words found in this booklet. Or, develop your own word list. Have students draw two cards from a container of index cards.

**MICHIGAN LEGACY ART PARK**

Tour Analysis Grid

<table>
<thead>
<tr>
<th>Gemotic Shapes</th>
<th>Organic Shapes</th>
<th>Repetition of Shapes</th>
<th>Has Symbolic Representation</th>
<th>Gemotic Shapes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frog</td>
<td>Unravel</td>
<td>Serpent Mound</td>
<td>Michigan</td>
<td>Satisfaction from Nature</td>
</tr>
</tbody>
</table>

**AFTER YOUR DAY AT THE ART PARK**

Describe your outdoor museum experience in:

A word _____________________________
A phrase ___________________________
A sentence __________________________

[Image of a group of people exploring a nature trail]

[Image of a group of people exploring an outdoor museum]

[Image of a group of people exploring a nature trail and an outdoor museum]

[Image of a group of people exploring a nature trail and an outdoor museum]
Kindergarten & First Grades
Exploring Michigan’s Plants and Animals

AT THE PARK
Tour the park with a special focus on Frog and Unravel. Make sure to share the notes from the previous pages of this booklet. On your walk, ask your students the discussion questions provided in this booklet about the featured sculptures.

IN THE CLASSROOM
Make a poster of these Overarching Questions to display in your classroom.

• What makes a place natural?
• What resources does the natural world provide?
• What can we learn from nature?

Collect natural objects (or pictures of objects) and sort them by attributes. Invite conversations about what might be causing these patterns.

Read books about the natural world. Discover what animals live where they do and why they live there. Wonder about the many ways plants and animals meet their needs so that they can survive and grow.

Create a “Cycles Found in Nature” bulletin board. Include visual images and vocabulary terms to support the concept of “cycles.” Examples may include: Forests (birth, growth, decay, regeneration), Plants (seed, seedling, plant, flower, fruit), Frogs (eggs, tadpoles, frogs), Butterflies (caterpillar, larva, butterfly), Twenty-four hours (day, night). Seasons (fall, winter, spring, summer).

Plant a window garden in your classroom. Have students plan, observe, and experiment with seeds. Keep a journal of the growth process in the form of drawings or words.

Discuss food webs and how animals interact together in an ecosystem. Make a model of how living and non-living organisms are dependent on each other in a freshwater (rivers, ponds, streams, wetlands) or forest ecosystem and get their energy from other animals and the sun. (Examples: Deer eat buds and leaves, therefore, they usually live in forested areas. Grasses need sunlight, so they often grow in meadows. Plants, animals, and their surroundings make up an ecosystem.)

Have a classroom conversation about the effects of human impact on the land. Provide examples through picture books and informational text. Examples might include cutting trees to produce paper and using resources to produce bottles.

Challenge your students to become good stewards of the Natural World. In the classroom, create a recycling box for cans and bottles, and a place to reuse paper.

Second & Third Grades
Exploring Michigan’s Natural Resources

AT THE PARK
Tour the park with a special focus on Frog, Unravel and Serpent Mound. Make sure to share the notes from the previous pages of this booklet. On your walk, ask your students the discussion questions provided in this booklet about the featured sculptures.

IN THE CLASSROOM
Make a poster of these Overarching Questions to display in your classroom.

• What makes a place natural?
• What resources does the natural world provide?
• What can we learn from nature?

Collect and observe objects found in nature. Have students group objects by similarities and differences. Discuss why and how patterns are organized. Discuss why and how patterns occur.

Individually, students create a sketchbook of patterns they collect. With guidance and support, students label each sketch with a simple sentence.

Make a class book called “Finding Patterns in the Natural World.” Use “zoom in” photographs, gathered from magazines and calendars, of plants, animals, and rocks. On each page, include an image and a caption about the patterns shown through the use of repetition of color, lines, shapes, textures.

Extend the study of patterns by taking it into other areas of the curriculum. Mathematics has patterns. Music has patterns. Where else might this idea lead you?

Create a classroom bulletin board of rubbings done with leaves, tree bark, and other natural objects. Label each one with the name of the natural plant or object.

Read books about frogs. Study the frog’s life cycle. Discuss how the changes that organisms go through during their life form a pattern.

Introduce questions about the natural world. Design experiments to gather more information and test to support or refute ideas.

• How does land change and what are some things that cause it to change?
• What are the different kinds of land and bodies of water?
• What do plants need to grow?
• How many types of living things can be found in a place?
• How are materials similar and different from one another, and how do the properties of the materials relate to their use?

Challenge your students to become good stewards of the Natural World. In the classroom, create a recycling box for cans and bottles, and a place to reuse paper.

Fourth & Fifth Grade
Exploring the Great Lakes’ Ecosystems

AT THE PARK
Tour the park with a special focus on Serpent Mound and Michigan. Make sure to share the notes from the previous pages of this booklet. On your walk, ask your students the discussion questions provided in this booklet about the featured sculptures.

IN THE CLASSROOM
Make a poster of these Overarching Questions to display in your classroom.

• What makes a place natural?
• What resources does the natural world provide?
• What can we learn from nature?

Define “ecosystem.” Present examples of the types of ecosystems found in Michigan. (i.e. river and stream ecosystems, coastal dune ecosystem, Great Lakes ecosystem, forest ecosystem) Identify what living and non-living components all ecosystems have in common.

Share basic facts about Michigan to reference throughout your unit(s) of study.

• State is made up of two large peninsulas—Upper Peninsula and Lower Peninsula
• Bordered by four of the five Great Lakes, with over 3,300 miles of shoreline
• Over half of the land in Michigan is forested (most is in the upper peninsula)
• More than 6,000 lakes and hundreds of miles of streams and rivers
• Major rivers include the Kalamazoo, Manistee, and the Grand River
• Vegetation is highly varied. U.P. forests are mostly coniferous, with a mix of red and white pines. L.P. also has evergreen forests, but more hardwoods - oak, beech, ash, and maple.
• Four seasons which range from frigid winters to steamy summers.

Collect samples of pond or river water and use it to study energy flow and food chains. Use cause
and effect questioning to examine relationships in this ecosystem.

Research one of Michigan’s ecosystems and design a brochure or poster to promote it.

Learn about the Mound-builders and identify the places where archaeologists have found evidence of these early cultures. Use maps to mark their locations and trace their trade routes in Michigan and throughout the Ohio and Mississippi River Valleys.

Research and report on a fascinating topic related to the Pre-Columbians that lived in Michigan. Choose one of these ways to share your findings: write an informational essay, a narrative story, a comic strip with captions, or a children’s picture book with text.

Read maps and study the natural landforms (rivers, lakes, wetlands, hills, meadows, forests). Think about how a place (Michigan) shapes the people who live there. How do they adapt to, use, and modify the natural resources?

Become a naturalist or a citizen scientist. Choose a plant or tree in your schoolyard, or backyard, to observe several times a week. Keep a log or journal of the changes that occur over time. Describe what you see. Be specific. Make sketches in your journal of your observations.

Sixth through Eighth Grades

Exploring the Biodiversity of the Great Lakes

AT THE PARK

Tour the park with a special focus on Michigan, Satisfaction from Nature, and Nurture/Nature. Make sure to share the notes from the previous pages of this booklet. On your walk, ask your students the discussion questions provided about the featured sculptures.

IN THE CLASSROOM

Make a poster of these Overarching Questions to display in your classroom.

- What makes a place natural?
- What resources does the natural world provide?
- What can we learn from nature?

Thomas Wolfe, an important American writer in the first half of the 20th century, said, “Nature is the one place where miracles not only happen, but happen all the time.” What are some of nature’s miracles? Discuss.

Use regional and state maps to identify Michigan’s inland waterways.

Using photographs of some of Michigan’s lakes and rivers, and the biodiversity found in and around them, create a “Why Should We Be Concerned About Water Quality” collage. Include messages (words, phrases, sentences) cut from the texts of magazines to include in your collage.

- What is biodiversity? Why is it important?
- How is biodiversity threatened in Michigan?
- How is biodiversity measured?
- How can people use knowledge of biodiversity to help make land-use decisions?
- How does one’s personal actions affect the environment?

Design a diagram or build a model to show the interconnections and interdependence within a natural community.

Create a contour map featuring a chosen section of an important river. In the map legend, use symbols to explain your map - elevation, distance (scale), and other significant points. Be ready to explain the science represented in your contour map.

Conduct water quality studies of Lake Michigan or one of its tributaries. Use the scientific method when conducting research and experimenting. When sharing results, present cause and effect relationships.

Plan a field trip to a nearby river, inland lake, Sleeping Bear Lakeshore, or on the Inland Seas Schooner.

Research invasive species associated with Michigan or the Great Lakes, the problems they present, how they were introduced, and how to prevent their spread in the future. Choose one of these ways to present research findings: write an expository essay, write a persuasive essay, write an opinion letter to a state representative, write an opinion piece for the local newspaper, create a cartoon strip with images and either dialogue bubbles or captions under each frame.

High School

Exploring the Environmental Challenges Facing the Great Lakes

AT THE PARK

Tour the park with a special focus on Nurture/Nature and Big Two-Hearted. Make sure to share the notes from the previous pages of this booklet. On your walk, ask your students the discussion questions provided about the featured sculptures.

IN THE CLASSROOM

Make a poster of these Overarching Questions to display in your classroom.

- What makes a place natural?
- What resources does the natural world provide?
- What can we learn from nature?

Read Ernest Hemingway’s short story, “Big Two-Hearted.” Compose a literary essay, responding to each of the following questions.

- What might the brook trout represent?
- What might the river represent?
- How does being out in nature and performing the simple rituals involved in fishing serve Nick?
- Why do you think Nick decides to wait for another day to fish the deep water, to fish the swamp?

Read Dan Egan’s nonfiction book, The Death and Life of The Great Lakes. Egan is a reporter for the Milwaukee Journal-Sentinel and senior water policy fellow at the University of Wisconsin-Milwaukee. This book deals with the current issues of lake ecology, environmental conditions, nonindigenous aquatic pests, and water quality.

Conduct a class debate: Should the Chicago River be returned to its normal water flow, thus breaking the link between the Mississippi River and the Great Lakes.

Read about major threats to biodiversity in the Great Lakes, focusing on cause and effect relationships. Research what it means for a species to be listed as threatened or endangered, and the role of government and individuals in protecting biodiversity.

Write an opinion letter to your state legislator or local newspaper sharing your views.

Write a personal narrative about an experience you’ve had related to the Great Lakes.

Discuss the concept of “sustainability,” evaluate how individual decisions affect the environment. Examine the UN Millennium Development Goals as they apply to global sustainability.

Have students select (or assign) a single recyclable product and trace it from a manufacturer to a recycling center. Create a diagram to show each step of the product’s cycle. Make a chart or table that examines the costs of making the product and the recycling of it. Write an opinion paper answering the question: Is recycling worth it? Provide evidence to support your opinion and offer an alternative solution.
ecosystem. MS-L5-2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. MS-L5-2-2 Construct an explanation for the predictable patterns of interactions among organisms across multiple ecosystems. MS-L5-2-5 Evaluate competing design solutions for maintaining biodiversity and ecosystem services. MS-ESS2-1 Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process.

ELA / LITERACY

RI.6-8.8 Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims. RST.6-8.1 Use text features such as subheadings, brackets, or other information (e.g., in a flowchart, diagram, model graph, or table). SL.6-8.6 Distinguish among facts, reasoned judgment based on research findings, and speculation in a text. WHST.6-8.1 Transform presented material into a formal or informal task.

HIGH SCHOOL (GRADES 9 – 12) Interdependent Relationships in Ecosystems

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-LS2-6 Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions; but changing conditions may result in a new ecosystem. HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. 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.

ART

ART.III.6.2 Develop the skill of interpreting artwork, searching for embedded meaning, function, and personal connections at a developing level. ART.III.6.3 Develop the ability to describe the artist’s choice of materials, techniques, media technology, and processes influence the viewer. ART.III.6.4 Develop critical thinking strategies, observing, comparing, and contrasting artworks. ART.III.6.5 Develop and defend informed aesthetic opinions about works of art using artistic vocabulary at a developing level. ART.IV.6.1 Recognize and describe how art contributes to and reflects all societies and cultures. ART.IV.6.2 Develop an understanding of the historical, social, and cultural contexts of artwork with aesthetic sophistication. ART.IV.6.3 Interpret artwork searching for embedded meaning, function, and personal connections at an emerging level. ART.IV.6.4 Use critical thinking strategies to observe, compare, and contrast artworks at an emerging level. ART.IV.6.5 Develop and defend informed aesthetic opinions about works of art using artistic vocabulary at an emerging level. ART.IV.7.1 Recognize, describe and analyze, and evaluate how art contributes to and reflects all societies and cultures at an emerging level. ART.IV.7.2 Articulate an understanding of the historical, social, and cultural contexts of artwork with an emerging level of aesthetic sophistication. ART.IV.8.2 Effectively interpret artwork, searching for embedded meaning, function, and personal connections.

ART.III.8.3 Effectively describe the artist’s choice of materials, techniques, media technology, and processes influence the viewer. ART.III.8.5 Develop and defend informed aesthetic opinions about works of art using artistic vocabulary at an emerging level. W.9-10.1 Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. W.9-10.2 Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. W.9-10.7 Conduct short, as well as more sustained, research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. SL.9-10.1 Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9-10 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively. SL.9-10.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.

ART

ART.III.HS.5 Intentionally use art materials and tools when applying techniques and skills to communicate ideas. ART.IV.HS.2 Describe the functions and explore the meaning of specific art objects within varied cultures, times, and places.

ART.III.HS.3 Critically observe a work of art to evaluate and respond to the artist’s intent using art vocabulary and terminology.
Jaye Lynn Trapp was an educator for Traverse City Area Public Schools for 22 years. Most of those years were spent servicing students at Central Grade School. During that time, her classes participated in Michigan Legacy Art Park’s educational residency program with Patricia Innis. Jaye Lynn worked closely with art teacher, Cherie Correll, helping to develop art-related curriculum for the park.

After she retired, Trapp moved to Tucson and became a docent at the Tucson Museum of Art. She now creates materials for visiting teachers and students, provides school tours at the museum, presents art talks in the community, and mentors new docents. Trapp has degrees from Central Michigan University in English, Art, and the Social Sciences, and a Masters’ Degree in Humanities.