

# CURRICULUM GUIDE

Kendall County Outdoor Education Center  
January 2023

KCOEC lessons and alignment to Illinois Learning Standards:

Common Core (CC)

<http://www.corestandards.org/>

Next Generation Science Standards (NGSS)

<https://www.nextgenscience.org/>

Illinois Learning Standards for Social Science (ISSS)

<https://www.isbe.net/Pages/Social-Science.aspx>

College, Career and Civic Life Framework for  
Social Studies State Standards (C3)

<https://www.socialstudies.org/c3>

Illinois State Learning Standards, Physical Education/Health (ILS)

<https://www.isbe.net/Pages/Physical-Education-and-Health.aspx>

# **LIVING HISTORY**

## **THE FIRST THANKSGIVING (first grade)**

Students reflect on their own Thanksgiving traditions before they delve into the past to recreate the First Thanksgiving. Participants are challenged to find food for the feast, prepare a fire for cooking, and then engage in Native American skill games.

C3: D2.His.2.K-2, D2.His.3.K-2, D2.His.4.K-2, D2.Geo.6.K-2, D2.Geo.7.K-2

## **NATIVE AMERICAN STORIES AND GAMES (second grade)**

Students listen to and participate in Native American stories used to explain nature. There is a strong emphasis on the Native American respect for nature. Animal furs and parts may also be shared with students. Native Americans learned important skills through playing games. Students will engage in these games which may include Stones, Sticks, Hunting Skills, Dart Toss, or Spear Throwing. Stories and games will be intertwined and seasonally appropriate.

ISSS: SS.His.1.2, SS.His.2.2, SS.H.3.2

C3: D2.His.2.K-2, D2.His.4.K-2, D2.Civ.10.K-2

## **LOCAL HISTORY (second grade)**

Our local community has not always been the way we know it today. Ever since the end of the ice age, the land we call home has continued to change as different people have lived here and used its resources. Local landforms have influenced our natural resources and the way we use the land. We have changed over time as have our cultural traditions. What are the characteristics of our community today? What used to be here? Students use maps and follow a map course as we travel through time and meet characters from the past. Currently we offer both a Yorkville and a Plano version of this lesson.

ISSS: SS.H.1.2 (Change over time), SS.H.3.2 (use historical sources), SS.H.2.2 (identify individuals and groups who have influenced local history)

CC:

## **SETTLEMENT OF ILLINOIS (third grade)**

Students learn about factors which influenced inhabitant's decisions to choose Illinois as a place to settle. They examine Native Americans, the French, and early settlers of Illinois to draw conclusions about their interactions and settlement patterns in Illinois. Participants hike through the park identifying natural resources useful to the Native Americans, the French, and the Pioneers. The lesson concludes with a Barter Game using Pioneer Tools. (Optional Game: "Settling Kendall County")

C3: D2.Geo.5.3-5, D2.Geo.6.3-5, D2.Geo.7.3-5, D2.Geo.8.3-5, D2.His.4.3-5

CC: RI.3.4, RI.3.10

NGSS: 3-LS4-3, 3-LS4-4

## **PIONEERING (third grade)**

Students learn about westward expansion through the pioneers. Students discuss how the westward movement affected families during the frontier times, and they learn about the jobs of different family members. Students have the opportunity to engage in hands-on pioneer chores including candle dipping,

rope making, leather branding, fire building with flint and steel, surveying using the Gunter's chain, and some wood working.

ISSS: SS.EC.1.3, SS.H.3.3

C3: D2.Civ.10.3-5, D2.His.4.3-5, D2.His.3.3-5

### **UNDERGROUND RAILROAD: THE ESCAPE (fourth grade)**

This is an outdoor action learning program. After establishing some background about the Underground Railroad, students learn how Illinois was a part of this movement of people from the south to Canada.

Along the way they stop at a station, they look for signs left by others, and they discuss the relationships between slavery and the American economy. Discussion includes Illinois' geography, political boundaries and settlement patterns as factors in the role Illinois played on the UGRR. Students will review maps and photos as primary resources.

ISSS: SS.G.1.4, SS.G.2.4, SS.CV.4.4, SS.H.1.4, SS.H.2.4, SS.H.3.4

C3: D2.Geo.7.3-5, D2.His.3.3-5, D2.His.4.3-5, D2.His.5.3-5, D2.His.16.3-5, IL.C.14

CC: MP.2, MP.4

### **UNDERGROUND RAILROAD: THE QUILT (fourth grade)**

This indoor program is designed for students to learn about slavery and the Underground Railroad in the United States in the mid-1800s. Students will focus on Economic and Political climates as well as the geography of the country and the history of Illinois on the UGRR. Several pieces of literature including Sweet Clara and the Freedom Quilt by Deborah Hopkinson will help to tell more of the story. Finally, students will recount their experience through the creation of a class quilt.

ISSS: SS.G.1.4, SS.G.2.4

CC: SL4.1, L.4.5, RI.4.1, RI.4.9

### **ILLINOIS NATURAL HISTORY (fourth grade)**

After engaging in a brief review of Natural Resources (renewable vs. non-renewable), the group will create a timeline starting with the Silurian Sea, through the Ice Age, and the arrival of humans in Illinois. The lesson continues with a hiking experience allowing students to examine Illinois natural resources first hand with a focus on Animal, Water, Soil, Rock/Mineral, and Plant resources.

ISSS: SS.G.2.4, SS.H.2.4

C3: D2.Geo.2.3-5, D2.Geo.3.3-5, D2.Geo.8.3-5

### **ILLINOIS HISTORY HIKE (fourth grade)**

Participants jump into the history of Illinois by acting out a brief class play highlighting significant points in the land we know as Illinois. The hike includes a stop in the woods to look at landforms and how they have changed over time. Stops also include Neshnabé'k to discuss Native Americans, the Fox River to discuss the French, and the Prairie to discuss the Pioneers and the settlement of Illinois as we know it. The lesson focuses on Illinois landforms, landmarks, people, places and events.

ISSS: SS.G.2.4, SS.H.2.4

C3: D2.Geo.2.3-5, D2.Geo.3.3-5, D2.Geo.8.3-5

### **NATIVE AMERICAN: Regional Resources Hike (fifth grade)**

How do cultural and environmental characteristics influence the way we live? Native Americans have lived on this land for well over 10,000 years according to archeologists who detail how these people crossed a land bridge through the Bering Strait during the Ice Age and began to populate North America. In this lesson, students will identify the various regions of the United States where Native Americans lived. Students will analyze the natural resources available and how Native Americans adapted to their environment. There is a focus on creating a map and using multiple resources to answer questions. ISSS: SS.IS.4.3-5 (Gather relevant information and distinguish among fact and opinion to determine credibility of multiple sources)

SS.IS.5.3-5 (Develop claims using evidence from multiple sources to answer essential questions)

SS.IS.6.3-5 (Construct and critique arguments and explanations using reasoning, examples and details from multiple sources)

SS.G.1.5 (Investigate how the cultural and environmental characteristics of places within the United States change over time.)

SS.G.2.5 (Describe how humans have utilized natural resources in the United States)

### **NATIVE AMERICANS IN ILLINOIS: CAHOKIA (fifth grade)**

Native Americans have lived on this land for well over 10,000 years according to archeologists who detail how these people crossed a land bridge through the Bering Strait during the Ice Age and began to populate North America. In this lesson, students will identify natural resources that allowed Native Americans to live on the land we now call Illinois. Students will read informational text and analyze artifacts to learn about life in Cahokia, the largest human settlement north of Mexico in the 12<sup>th</sup> century. ISSS: SS.IS.4.3-5 (Gather relevant information and distinguish among fact and opinion to determine credibility of multiple sources)

SS.IS.5.3-5 (Develop claims using evidence from multiple sources to answer essential questions)

SS.IS.6.3-5 (Construct and critique arguments and explanations using reasoning, examples and details from multiple sources)

SS.G.1.5 (Investigate how the cultural and environmental characteristics of places within the United States change over time.)

SS.G.2.5 (Describe how humans have utilized natural resources in the United States)

### **FRENCH FUR TRADE (fifth grade)**

In learning about the French Fur Trade Business of the 1600's, students will understand the environmental factors that influenced transportation and trade in Illinois, and discuss the economic factors related to the location of resources. Students learn about the primary characters of the fur trade business, and then they read maps to follow a course through the woods and along the river as they discover the life of the voyageurs.

ISSS: SS.G.1.5, SS.G.2.5, SS.EC.1.5, SS.H.3.5

### **THE LEWIS AND CLARK EXPEDITION (fifth grade)**

Celebrate this famous expedition and become members of the Corps of Discovery! Students brainstorm what to bring, identify objectives of the trip, and identify a variety of plants and animals discovered in the Louisiana Territory. They read maps and follow a course as they take on the roles of Thomas

Jefferson, Meriwether Lewis, William Clark, Sacajawea and the Corps. The lesson focuses on use of natural resources, the connection to national government, and the causes and effects of this amazing expedition.

ISSS: SS.G.2.5, SS.EC.3.5, SS.His.3.5

**THE AMERICAN REVOLUTION (fifth grade)**

Students learn about the major causes of the American Revolution as well as how and why the colonists fought for their independence. Students are challenged to read and follow a map course as they take on the role of the soldiers. Participants have the opportunity to learn about colonial taxes as they earn and spend shillings during their adventure.

ISSS: SS.IS.6.3-5, SS.CV.2.5, SS.H.1.5, SS.His.3.5

C3: D2.Geo.2.3-5, D2.His.1.3-5, D2.His.14.3-5, D2.Civ.4.3-5, D2.Civ.10.3-5, D2.Eco.12.3-5

CC: SL.S.1, MP.4

# **TEAM BUILDING**

## **TEAM BUILDING: GAMES (Kindergarten – Third Grades)**

Early elementary students work on following directions and working both independently and cooperatively to complete tasks. Participants are encouraged to practice team building skills such as playing safe, treating others with respect, using good communication skills (eye contact, listening, speaking and not yelling), cooperating, and encouraging others in the group.

ILS: 21A1abc, 21B1, 24A1ab

## **TEAM BUILDING: MOBILE INITIATIVES (Fourth – Sixth Grades)**

Late elementary students engage in initiatives that challenge them in problem solving, communication, trust and cooperation. Participants learn to work with others cooperatively in achieving a goal while still accepting responsibility for their own actions. The group is encouraged to play safe, have fun, and put forth their best effort.

ILS: 21A2ab, 21B2, 24A2ab

## **TEAM BUILDING: CHALLENGE COURSE (Seventh –Twelfth Grades)**

Participants will engage in a variety of games and mobile initiatives before venturing onto the challenge course. Participants then work on following directions and adhering to safety precautions. They are encouraged to set goals for themselves and for the group, to reach consensus, to share ideas, and to share decision making. Students are encouraged to take on leadership roles as they work with their group. They are also encouraged to take risks and push themselves outside of their own personal comfort zones. Participants engage in processing throughout the challenge course to evaluate strengths and weaknesses of the group. The challenge course is designed to challenge participants both physically and mentally.

ILS: 21A3abc, 21A4abc, 21B3, 21B4, 21A5, 21B5, 24A3bc, 24A4b, 24A5

# **MAP AND COMPASS SKILLS**

## **FIRST GRADE MAP SYMBOLS (*Hike the Colors*)**

Students will review different kinds of maps (globe, world map, relief map, U.S map, atlas, Illinois map, and the Hoover Forest Preserve map). Focus is on (1) maps of all types and (2) recognizing that symbols represent real features. Students then learn about map colors and symbols with a focus on the Title, Map Key and Compass Rose. They use the map and “Hike the Colors” of Hoover. This is a large group activity that introduces the compass as it finds north.

**(Leprechaun Hike)** Same lesson, but uses a set of leprechaun clues to find a hidden treasure (March).

C3: **D2.Geo.1.K-2** (Construct maps, graphs, and other representations of familiar places)

CC: **MP.5** (use appropriate tools strategically)

## **LOCAL LANDFORMS (first grade)**

Different landforms have different functions across the earth. Locally, we have hills which shed water down into valleys where the water collects in small streams which flow into the Fox River. We also have plains or prairies which use the long roots of the grasses and flowers to hold the water in the ground, or in the lakes and ponds. These prairies are very different from the forests of our region which boast less vegetation in a whole new ecosystem. Students will explore these different landforms and create a map to show them all.

C3: **D2.Geo.3.K-2, D2.Geo.6.K-2**

## **SECOND GRADE MAP SYMBOLS (*Why Go Outside? hike*)**

Students will review different kinds of maps (globe, world map, relief map, U.S map, atlas, Illinois map, and the Hoover Forest Preserve map). Focus is on (1) map key/legend and (2) location of physical features on the map. A map symbols card game is used. Students travel together as a large group to find specific locations in the park using a map and compass.

**(Local History)** This lesson can be adapted to review the local history of either Yorkville or Plano.

C3: **D2.Geo.2.K-2** (Use maps, graphs, photographs, and other representations to describe places and the relationships and interactions that shape them)

C3: **D2.Geo.9.K-2** (Describe the connections between the physical environment of a place and the economic activities found there)

CC: **MP.5** (use appropriate tools strategically)

## **THIRD GRADE MAP SKILLS WITH COMPASS (*Little Brown Shed hike*)**

Students will review map skills from previous grades using a map symbols card game. Focus is on (1) map key/legend, (2) distance scale, and (3) introduction to the compass and its use in map orientation. Students seek specific locations in the park. Students are now working together in small groups but traveling together as a large group to find clues which guide them on the course. Each small group uses a compass and takes turns leading the whole group.

C3: **D2.Geo.2.3-5** (Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions and their environmental characteristics)

CC: **MP.5** (use appropriate tools strategically)

#### **FOURTH GRADE MAP SKILLS WITH COMPASS (*Landmark Navigation*)**

Students review maps using a map key game in small groups. Focus is on (1) map key/legend, (2) distance scale, and (3) topography. There is an emphasis on use of the compass to both orient the maps and recognize cardinal directions. Students seek specific locations through landmark navigation.

Students are now working together and traveling in small groups. Each group/student uses a compass.

C3: **D2.Geo.2.3-5** (Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions and their environmental characteristics)

C3: **D2.Geo.3.3-5** (Use maps of different scales to describe the locations of cultural and environmental characteristics)

CC: **MP.5** (use appropriate tools strategically)

#### **FIFTH GRADE COMPASS SKILLS**

Students may review maps using a map key game in small groups. Focus is on the review of compass parts and how it works. Students learn to set the compass for specific bearings and follow those bearing to a predetermined location. Activities can include Triangulation, Decoding, and Distance Pacing.

Students are now working together in small groups. Each group/student uses a compass.

ILS: **21B2** (Work cooperatively with a partner or small group to reach a shared goal during a physical activity)

CC: **MP.5** (use appropriate tools strategically)

#### **FIFTH GRADE IDITAROD LESSON (*winter only*)**

The famous dogsled race, the Iditarod, takes place every year in March. Students learn about race history, rules and requirements, and details about the current race. Focus is on teamwork and compass skills. After some indoor compass training, mushers and their dogs select a sled to compete in the Hoover Iditarod by following compass bearings from checkpoint to checkpoint. Snow is most helpful in this race!

ILS: **21A2abc, 21B2, 24A2ab** (Team Building)

NGSS: **3-5.ETS1-1** (Analyze a design problem reflecting a need or want that includes specified criteria for success and constraints on materials, time or cost.)

C3: **D2.Geo.2.3-5** (Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions and their environmental characteristics)

CC: **MP.5** (use appropriate tools strategically)

CC: **MP.2** (reason abstractly and quantitatively)

#### **SIXTH GRADE ORIENTEERING**

Students briefly review map and compass, and they learn about orienteering as a sport. Students work together independently in small groups. Each group uses a map and compass to follow an orienteering course in an orienteering race. Groups are timed and scores are kept based on the number of correct locations found as indicated on the group punch cards.

ILS: **21A2ab, 21B2a** (Team Building)

C3: **D2.Geo.2.6-8** (utilize cardinal and intermediate directions in terms of location on a map) (differentiate between absolute and relative location)

CC: **MP.5** (use appropriate tools strategically)



## **MIDDLE and HIGH SCHOOL ORIENTEERING**

Students briefly review map and compass. Students will set the compass for specific bearings and follow those bearings to a predetermined location. Students work independently in small groups with a map and compass to follow an advanced orienteering course.

ILS: **21A3ab, 21B3a** (Team Building)

CC: **MP.5** (use appropriate tools strategically)

# **ENVIRONMENTAL SCIENCE**

## **RECYCLING AT LUNCH (any grade)**

Every day at lunch students will receive a quick lesson on sorting garbage and recycling. Items will be placed in appropriate collection containers. Emphasis is on reducing the impact of humans in our local environment.

*NGSS: K-ESS3-3*

## **INTERPRETIVE HIKE (any grade)**

Groups of students and adults are led on a hike of exploration. Naturalists will provide interpretation of group discoveries. Hikes will focus on group learning needs as well as hiking abilities.

Illinois Learning Standards: 21A1

## **SENSORY AWARENESS (PRE-K)**

Using Miss Inga Face, students will identify their five senses. Those senses are then tested through a variety of activities involving listening, touching, smelling and looking. This lesson includes an interpretive hike and may include some songs, games and station activities (leaf rubbing and wood blocks).

Illinois Learning Standards: 21A1abc

## **SIGNS OF THE SEASON (PRE-K)**

What is Fall? Winter? Spring? Summer? What clues does nature give us each season? How is nature changing right now in preparation for the next season? Weather is a combination of sun, wind, temperature and precipitation in a specific region at a specific time. When people track these conditions over time, weather patterns emerge. Students will take a hands-on approach to identifying elements of weather and patterns before embarking on an interpretive hike to find natural clues to support predictions.

*NGSS: K-ESS2-1, K-PS3-1*

*CC: MP.2*

## **ANIMALS IN ILLINOIS (Indoor Lesson) (KDG)**

What do plants and animals need to survive? Where do animals live and why do they live there? Students will determine the difference between wild and domestic animals, as well as native and nonnative animals of Illinois. Students will identify different animal parts (feet, pelts, skulls, etc) and describe their major functions. Discussion will focus on the relationship between what animals need to survive and where they live. Students will have the opportunity to touch real animal pelts.

*NGSS: K-ESS3-3; K-LS1-1*

*CC: K.MD.A.2, K.CC*

## **ANIMALS IN ILLINOIS ECOSYSTEM HIKE (KDG)**

What do plants and animals need to survive? Where do animals live and why do they live there? This lesson is used in conjunction with the indoor lesson and builds on those concepts. Students will be challenged to find examples of how plants and animals change their environment to meet their needs. Students are looking for nests, holes, seeds and plants growing in strange places. Students will identify components of a woodland ecosystem based on their findings.

*NGSS: K-ESS2-2, K-ESS3-1, K-ESS3-3; K-LS1-1*

*CC: K.MD.A.2*

### **WEATHER: DESIGN SHADE (KDG)**

What is the weather like today, and how is it different from yesterday? Students will focus specifically on the sun and how it affects different earth surfaces (sand, soil, rocks, snow, and water). Students can use thermometers as needed to determine “warmer/cooler”. Students will also be given materials to create shade over their earth surface that will reduce the warming effect of the sun.

*NGSS: K-PS3-1, K-PS3-2*

*CC: K.MD.A.2*

### **FORCES IN MOTION (KDG)**

Students will engage in various experiments using push and pull to analyze how forces affect an object and determine why an object moves the way it does. This lesson includes rolling balls on a ramp, pulling a log, pushing objects along a board with a tool, and pulling various weights on sleds. All these experiments take place outside.

*NGSS: K-PS2-1, K-PS2-2.1*

*CC: K.MD.A.1, K.MD.A.2, SL.K.3*

### **INSECTS AND LIFE CYCLES (First Grade)**

Students will briefly identify major characteristics of insects (3 body parts, 6 legs, exoskeleton) before going out to collect samples. Insects are collected using sweep nets in grasses or the hunt-and-search method in the woods. Students then sort their findings to identify the true insects. Of the insects collected, we will determine life stages of those insects, discuss life cycles, identify how young insects are like but not exactly like their parents, and determine how insects fit into the food chain. Students will also learn about galls.

*NGSS: 1-LS3-1*

*CC: MP.2, MP.5, W.1.8*

### **ANIMALS (First Grade)**

Young plants and animals are *like* but not *exactly like* their parents. Students show how traits and behaviors of animal offspring are inherited from their parents to help them survive. Students will match parents and offspring before engaging in an exploration hike. In animal survival, what tricks do animals use to protect and care for their young? Learn about coloration, sound and homes. Finally, students will be asked to use an animal “trick” to create protection for themselves.

*NGSS: 1-LS1-1; 1-LS1-2; 1-LS3-1*

*CC: W.1.8, MP.2, 1. MD.A.1*

### **PLANTS (First Grade)**

Young plants and animals are *like* but not *exactly like* their parents. Students show how plant are inherited to help them survive. Students will find and identify same-species plants in different growing stages to see how they are the same and different. Using games, students identify defense mechanisms and engage in an exploration hike. What characteristics help these plants survive? Finally, students will be asked to use a plant “trick” to create protection for themselves.

*NGSS: 1-LS1-1; 1-LS1-2; 1-LS3-1*

*CC: W.1.8, MP.2, 1. MD.A.1*

### **SEASONAL CYCLES (first grade)**

How does the rotation of the earth and its orbit around the sun cause seasonal change? Review the seasons. Students will conduct research by making observations that describe patterns of the sun and moon during an interpretive hike to look for clues about the changing seasons. Discussion will focus on observation of the sun and its movement across the sky, and that relationship between the amount of daylight and the time of year. Students will create or use a sun dial to track sun movement during their visit and demonstrate seasonal cycles. This lesson may include some games to demonstrate the challenge of plant and animal survival during different seasons.

*NGSS: 1-ESS1-1; 1ESS1-2*

*CC: W.1.8, MP.2, MP.4, MP.5, 1.OA.A1*

### **OBSERVATION SKILLS HIKE (first grade)**

Good scientists use their skills of observation to gather data which they use to understand the natural world. In this lesson, students define what it means to observe, and they practice those skills in several activities. Students will make observations of external features of both natural and artificial items. Students are challenged to use their senses to make observations about the natural world, to use comparative language, and to use tools to collect data.

*ILS: 21A1abc*

*CC: MP.2, MP.5, W.1.8*

### **LIGHT AND SOUND (first grade)**

We know that vibrating materials can make sound, and sound can make materials vibrate. How does sound occur in the natural world? We can study animals to see how they make their unique sounds, and we can replicate that sound.

Objects can be seen only if they are illuminated. What happens if objects are placed in a beam of light? What kinds of objects allow the light to pass through? Students will experiment with both light and sound using natural materials.

*NGSS: 1-PS4-1, 1-PS4-2, 1-PS4-3*

*CC: W.1.8, SL.1.1*

### **ANIMAL HABITATS: HIKE and GAMES (second grade)**

There are many different kinds of living things in an area, and they exist in different places on land and in water. Students will identify the 5 components of habitat: food, water, shelter, air and space.

Students will identify ways in which living things depend on one another for survival. Discussion will include food webs. What kinds of animals and homes are found in this local habitat? How does that differ from animals in other habitats (ie: desert, ocean, polar regions)? Compare the diversity of life within different habitats. Students may match animals with their homes using picture cards. Games exemplify the struggle for survival in the wild and may include Predator-Prey, Bat and Moth, Hibernate Migrate Stay Active, Shrinking Habitat, or Oh Deer!

*NGSS: 2-LS4-1*

*CC: MP.2, W.2.8*

### **WATER ON EARTH (second grade)**

Students will understand the difference between creeks, rivers, ponds and lakes, and they will demonstrate that understanding by creating a map of these different water bodies. Students will then learn about where water is found on Earth; discussion includes water all forms through the water cycle. Finally, students will explore water movement that changes the shape of land, and then create solutions that slow or prevent that change. This lesson includes a hike to find water in the woodlands.

*NGSS: 2-ESS2-1, 2-ESS2-2, 2-ESS2-3*

*CC: MP.5, W.2.8, SL.2.2*

### **PLANTS AND SEED DISPERSAL (second grade)**

What do plants depend on to grow? Sunlight and water, of course! Hike through the grasslands and woodlands in search of evidence to support this fact. Students will make observations and collect data which they will use to make comparisons in a bar graph. Discussion points along the hike include pollination, seed development, and seed dispersal. How do animals assist plants in these processes? Students will work in small groups to create and share their interpretations through a short skit.

*NGSS: 2-LS2-1, 2-LS2-2*

*CC: MP.2, 2.MD.D.10*

### **RECYCLING: NATURAL SYSTEMS (second grade)**

We talk about recycling in our homes and schools, but what does it really mean? What is the difference between Reduce, Reuse and Recycle? Students will have an opportunity to sort materials by property and use. A discussion on natural recycling systems will lead to an investigation outside of decomposers and the work they do. Does decomposition happen quickly or slowly? What evidence can we find to show how nature can recycle itself?

*NGSS: 2-ESS1-1*

*CC: MP.2, W.2.8*

### **ENVIRONMENTAL CHANGES (Third grade)**

When the environment changes, what happens to its organisms? Some life forms that once lived on Earth are no longer here. Fossil provide evidence of such life forms and their environments. Students will learn about people and animals of Illinois' past, and how life changed for both over time. Activity will include a fossil study. Students will play "Oh Deer" to understand environmental change in our modern world and how organisms react to that change. Finally, students will hike and study specific plants (dependent on the season) and how they survive in their habitat (well, less well, or not at all).

*NGSS: 3-LS4-1, 3-LS4-3, 3-LS4-4*

*CC: 3.MD.B.3*

### **TRAITS (third grade)**

Many characteristics are inherited from our parents, but others are a result of our environment. How does the environment affect the traits that organisms develop? How do those variations provide advantages in surviving, mating and reproducing (natural selection)? Students define the term “trait” and identify life cycle stages to recognize that all living things go through the same process of birth, growth, reproduction and death. In the woods, students will select trees of the same species to identify traits and variations, and each group will make a brief presentation on their species. Discussion continues into animal traits.

*NGSS: 3-LS3-1, 3-LS3-2, 3-LS4-2*

*CC: R.I.3.7, SL.3.4, MP.2, 3.MD.B.3*

### **PLANT AND SEED STUDIES/WILDFLOWERS (third grade)**

Students will identify seed parts through the story of Little Sprout. They will dissect bean seeds, and then play a germination game. Lesson will include discussion of the unique and diverse life cycles of plants to understand the common factors of birth, growth, reproduction and death. The main focus will be on seasonal wildflowers and their life cycles. Activities include matching picture cards, hiking, and plant ID. Small groups of students will be asked to research and then introduce a specific plant to the rest of the group.

*NGSS: 3-LS1-1*

*CC: RI. 3.7, SL.3.4*

### **ANIMAL HABITATS AND ECOSYSTEMS (third grade)**

Being a part of a group helps animals obtain food, defend themselves and cope with changes. Groups may serve different functions and vary dramatically in size. Populations live in a variety of habitats, and change in those habitats affects the organisms living there. When the environment changes in ways that affect a place’s physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. Some plants and animals that once lived on earth are no longer found anywhere; fossils provide evidence of those organisms and their environments.

*NGSS: 3-LS2-1, 3-LS4-3, 3-LS4-4*

*CC:*

### **LANDFORMS: WEATHERING AND EROSION (fourth grade)**

The lesson begins with examination of topographic maps to identify landforms. They may play a game using landform words. Students will hike to find examples of erosion and ongoing earth changes with a focus on rainfall and the movement of particles. Lessons taught in the winter may be able to use ice from the river to discuss glaciers and their effects on Illinois.

*NGSS: 4-ESS2-1, 4-ESS2-2*

*CC: RI.4.7*

### **ANIMAL SURVIVAL (fourth grade)**

Plants and animals have internal and external structures that serve various functions in growth, survival, behavior and reproduction. The lesson will focus on unique animal structures and how they receive and process information. Students will handle animal pelts and parts. In the woods, students will identify a variety of animals living in that area, and they will gather evidence to explain specific animal behaviors. Student presentations will include facts taken from text, and measurements taken from lines of symmetry on plants.

*NGSS: 4-LS1-1, 4-LS1-2*

*CC: SL.4.5, 4.G.A.3*

### **WETLANDS AND WATERSHEDS (fifth grade)**

How is water distributed on Earth? Students begin with a water distribution activity so they can create a graph. Next, students engage with the enviroscape watershed model to define watershed and differentiate between point source and non-point source pollution. During a hike, students examine facts about Illinois water, analyze settlement patterns, and evaluate the values and threats of wetlands. Finally, students are challenged to assess their own impact on the local watershed and identify stewardship practices currently in place to protect Earth's resources in each of its four major systems (geosphere, biosphere, hydrosphere and atmosphere).

*NGSS: 5-ESS2-1, 5-ESS2-2, 5-ESS3-1*

*CC: W.5.9, MP.2, MP.4*

### **ECOSYSTEMS (fifth grade)**

Students will offer ideas to define ECOSYSTEM, a definition to be revisited at the conclusion of the lesson. Students will develop a food chain model using examples from the prairie, and the focus will be on the origin of energy from the sun. Students will conclude that plants get the materials they need for growth from the air and sun, and less from the soil. In the woods, students will find examples of food web components including fungi and bacteria as decomposers to recycle nutrients back into the soil. They will define by example the cycle of matter and energy in this ecosystem. Students will find examples to support an argument for a healthy ecosystem in which specific needs of a variety of organisms are met. What happens to the balance of an ecosystem when a new species is introduced?

*NGSS: 5-PS3-1, 5-LS1-1, 5-LS2-1*

*CC: MP.2, MP.4*

### **STEM – SCIENTIFIC METHOD (fifth grade)**

Scientific method involves asking a question, doing some research, forming a hypothesis, gathering materials, developing a procedure for gathering data, analysis of data and finally developing a conclusion. In this lesson, students will establish vocabulary as it relates to the scientific method. They will then focus on a question and conduct their research outside in a natural setting as they work through to their conclusion. This lesson puts students in a position to plan and carry out an investigation.

*ILS: 21A2ab, 21B2a, 24A2ab*

*CC: RI.5*

### **BIODIVERSITY (sixth grade)**

Students will begin by playing a game to illustrate the necessity of balance within an ecosystem. With that concept clear, students will move into a woodland ecosystem to conduct a plot study. They will review vocabulary, conduct the study, and analyze data. They will identify populations of organisms and how they are dependent on their environment with consideration of both biotic and abiotic factors. After analyzing competition of organisms for resources, students should be able to predict outcomes in terms of growth and reproduction. Students will provide examples of symbiosis, competition and predation. Students are encouraged to identify patterns of interactions between organisms, both living and nonliving.

*NGSS: MS-LS2-1, MS-LS2-2*

*CC: WHST.6-8.9, SL.8.4, 6.SP.B.5*

### **ENERGY IN ECOSYSTEMS (sixth grade)**

Remember those formulas for photosynthesis and respiration? After a quick review, students will engage in hands-on experiments outside which illustrate the transfer of matter and energy between producers, consumers and decomposers. Students will identify real-life examples of these components and create a model to demonstrate understanding of their work within the ecosystem. The lesson includes both classroom time, experiment time, and an outdoor hike.

*NGSS: MS-LS1-6, MS-LS1-7, MS-LS2-3*

*CC: WHST.6-8.9, RST.6-8.1*

### **HUMAN IMPACT (sixth grade)**

Students will evaluate human use of renewable and nonrenewable resources to determine the impact on humans, the environment, and ecosystem biodiversity. After contrasting renewable and nonrenewable natural resources, students will be divided into different world regions with respective natural resources to collect using respective technology. Following the activity, students will construct an argument for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

*NGSS: MS-ESS3-1; MS-ESS3-3, MS-ESS3-4*

*CC: MP.2; 7.RP.A.2; 7.EE.B.4*

*ILS: 21A2abc, 21B2*

### **CLIMATE SCIENCE (sixth grade)**

Ecosystems change over time and are affected by human impact. All of our spheres reflect these changes - the biosphere, atmosphere, cryosphere, hydrosphere and geosphere. Our increasing knowledge of Earth's ecosystems helps us to better understand our human role in environmental stewardship. This lesson provides background information and engages students in games that teach about the carbon cycle. Students will measure trees to gather data about carbon sequestration and extrapolate on that data to make predictions.

*NGSS: MS-ESS3-5*



**TREES: ALL DAY CROSS –CURRICULAR PROGRAM (sixth grade)**

This very unique curriculum was written by a local 6<sup>th</sup> grade teacher to tie together Math, Language and Science. The program is designed to last for a full day and includes both small group and large group activities. The materials are available for review upon request.

**ALDO LEOPOLD CONSERVATION (seventh and eighth grades)**

Students will learn about Aldo Leopold and his conservation land ethic. A selection will be read from [A Sand County Almanac](#) before students engage in related activities. His essays follow the months, so this topic is relevant any time of the year. Instructors will tailor this package curriculum to meet the specific needs of your group.