Science 21 Alive

This collaborative program uses the skills and expertise of the staff of the Center for Environmental Education to support your Science 21 curriculum.

Arrange for in-school visits by CEE naturalists or plan a field trip to the Madden Outdoor Education Center to support your SCIENCE 21 curriculum.

All programs are directly related to and support the Science 21 curriculum.

Choose from one of the Science 21 Alive programs listed by grade level on the following pages. The program descriptions begin on page 9.

Program Fees

There is no fee for districts that are members of the P/NW BOCES Center for Environmental Education. For non-members, the fees are as follows:

School Site:	$285 for a half day (2 program minimum) $435 for a full day
Madden Visit:	$435 for a one day trip to Madden for up to 60 students

(All programs are eligible for state aid reimbursement through the environmental COSER)

To book a program: http://www.pnwboces.org/Environmental/PDF/ProgramRequestForm.pdf

For more information call or email Rachel 845-225-9256, ceeschedule@pnwboces.org

SCIENCE 21
SCIENCE FOR THE 21ST CENTURY

Center For CEE Environmental Education
at P/NW BOCES

BRINGING NATURE TO KIDS & KIDS TO NATURE
THROUGH SCIENTIFIC EXPLORATION

KINDERGARTEN

UNIT 1	UNIT 2	UNIT 3
Bat & Moth	Bat & Moth	Bat & Moth
Forest Ecology	Forest Ecology	Birds/Raptors
Insects: Incredible Creatures	Keep in Touch	Classroom Pond
Keep in Touch	Nature Activities to Reconnect with Our Natural World	Composting: Nature's Recyclers & Decomposers
Nature Activities to Reconnect with Our Natural World	Nature Scavenger Hunt	Food Webs
Nature Scavenger Hunt	Wildlife	Forest Ecology
Wildlife		Hibernation
		Insects: Incredible Creatures
		Mammals of New York State
		Marine Ecosystems
		Nature Activities to Reconnect with Our Natural World
		Nocturnal World
		Pollination Partnerships
		Pond Ecology
		Seed Study
		Soil: The Basis of Life
		Supermarket Botany
		Turtles, Frogs, Toads & Snakes
		Wildlife

GRADE 1

UNIT 1	UNIT 2	UNIT 3	UNIT 4
Birds/Raptors	Keep in Touch	Amazing Journey of Water	A, Bee, C's of the Honeybee
Mammals of New York State	Nature Scavenger Hunt	Marine Ecosystems	Classroom Pond Study
Nature Scavenger Hunt		Nocturnal World	Composting: Nature's Recyclers & Decomposers
Wildlife			Fearsome Predator
Wildlife CSI			Food Webs
			Forest Ecology
			Hibernation/Winter Adaptation
			Insects: Incredible Creatures
			Nature Activities to Reconnect with Our Natural World
			Pollination Partnerships
			Pond Ecology/Classroom
			Skull Study
			Soil: The Basis of Life
			Supermarket Botany
			Turtles, Frogs, Toads & Snakes
			Wildlife
			Wildlife CSI

GRADE 2

UNIT 1	UNIT 2	UNIT 3	UNIT 4
Weather	Food Webs	A, Bee, C's of the Honeybee	Food Webs
	Forest Ecology	Birds/Raptors	Hibernation
	Hibernation	Classroom Pond Study	Mammals of New York State
	Mammals of New York State	Composting: Nature's Recyclers & Decomposers	Nocturnal World
	Turtles, Frogs, Snakes	Crayfish	Skull Study
	Weather	Fearsome Predators	Turtles, Frogs & Snakes
	Wildlife	Food Webs	Weather
		Forest Ecology	Who Eats Who?
		Hibernation	Wildlife
		Insects: Incredible Creatures	
		Mammals of New York State	
		Nature Activities	
		Pollination Partnerships	
		Pond Ecology	
		Seed Study	
		Skull Study	
		Soil: The Basis of Life	
		Supermarket Botany	
		Tree Life Cycle	
		Turtles, Frogs, Toads & Snakes	
		Weather	
		Who Eats Who?	
		Wildlife	
		Wildlife CSI	

GRADE 3

UNIT 1	UNIT 2	UNIT 3	UNIT 4
Composting: Nature's Recyclers & Decomposers		Amazing Journey of Water	A, Bee, C's of Honeybees
Forest Ecology		Geology/Rocks & Minerals	Bat & Moth
Examining Invasive & Native Competition		Hudson River	Birds/Raptors
Mapping Your School's Ecological Resources		Mapping Your School's Ecological Resources	Butterflies
Pollination Partnerships		Soil: The Basis of Life	Composting: Nature's Recyclers & Decomposers
Rainforest		We All Live in a Watershed	Fearsome Predator: Separating Fact From Fallacy
Seed Study		Weather	Food Webs
Soil: The Basis of Life			Forest Ecology
Supermarket Botany			Forest Measurements/Plot Study
Tree Life Cycle			Hibernation/Blubber Glove
			How Beavers Built the Hudson Valley
			Insects: Incredible Creatures
			Invasive Species
			Mammals of New York State
			Mapping Your School's Ecological Resources
			Nature Activities
			Nocturnal World
			Owl Pellet Study
			Pollination Partnerships
			Pond Ecology
			Predators
			Rainforest
			Skull Study
			Tropical Rainforests
			Turtles, Frogs, Toads & Snakes
			Who Eats Who?
			Wildlife CSI

GRADE 4

UNIT 1	UNIT 2	UNIT 4
Forest Measurements	A, Bee, C's of the Honeybee	Amazing Journey of Water
Map Making Adventure	Birds/Raptors	Geology/Rocks & Minerals
Mapping Your School's Ecological Resources	Classroom Pond Study	Hudson River
Orienteering	Composting: Nature's Recyclers & Decomposers	We All Live in a Watershed
Tropical Rainforests	Examining Invasive & Native Competition	Weather
Weather	Fearsome Predators	
	Food Webs	
	Forest Ecology	
	Hibernation	
	How the Beavers Built the Hudson Valley	
	Insects: Incredible Creatures	
	Mammals of New York State	
	Nature Activities to Reconnect with Our Natural World	
	Nocturnal World	
	Owl Pellet Study	
	Pollination Partnerships	
	Pond Ecology	
	Seed Study	
	Skull Study	
	Soil: The Basis of Life	
	Supermarket Botany	
	Tree Life Cycle	
	Tropical Rainforest	
	Turtles, Frogs, Toads & Snakes	
	Who Eats Who?	
	Wildlife	
	Wildlife CSI	

GRADE 5

UNIT 4

A, Bee, C's of the Honeybee
Amazing Journey of Water
Birds/Raptors
Classroom Pond Study
Composting: Nature's Recyclers & Decomposers
Examining Invasive & Native Competition
Fearsome Predators
Food Webs: Energy Transfer
Forest Ecology
Hibernation
Hudson River
Forest Measurements/Plot Study
Geology: Rockin' the Valley/Earth Science: Rocks & Minerals
How Beavers Built the Hudson Valley
Insects: Incredible Creatures
Mammals of New York State
Mapping Your School's Ecological Resources
Nature Activities to Reconnect with Our Natural World
Nocturnal World
Oil Spills: Where Did the Oil Go?
Owl Pellet Study
Pollination Partnerships
Pond Ecology
Rainforest
Seed Study
Skull Study
Soil - The Basis of Life
Supermarket Botany
Tree Life Cycle
Tropical Rainforests
Turtles, Frogs, Toads & Snakes
Understanding the Consequences of Ecosystem Manipulation
Weather
Where Does My Garbage Go?
Who Eats Who?
Wildlife
Wildlife CSI

GRADE 6

UNIT 1	UNIT 3	UNIT 4
Biomimicry: The Science of Today and Jobs of Tomorrow	Weather	A, Bee, C's of the Honeybee
Energy Transfer in Predator/Prey Relationships	Geology/Rocks & Minerals	Amazing Journey of Water
Map Making Adventure		Bat and Moth: An Evolution Arms Race
		Biography of a Strawberry: A Lesson in Systems Thinking
		Birds/Raptors
		Classroom Pond Study
		Energy Transfer in Predator/Prey Relationships
		Fearsome Predators
		Forest Ecology
		Forest Measurements
		Hibernation
		How Beavers Built the Hudson Valley
		If the World Were a Village: Multiple Perspectives
		I'm Only One Person, What Can I Do?
		Insects: Incredible Creatures
		Into the Great Unknown: What Happens to My Recyclables?
		Introduction to Sustainability
		Mammals of New York State
		Mapping Your School's Ecological Resources
		Marine Ecosystems
		Nature Activities to Reconnect with Our Natural World
		Nocturnal World of New York
		Oil Spills: Where Does the Oil Go?
		Owl Pellet Study
		Pollination Partnerships
		Pond Study
		Recycling: What Happens to My Recyclables?
		Skull Study
		Soil: The Basis of Life
		Understanding the Commons
		Understanding the Consequences of Ecosystem Manipulation
		We All Live in a Watershed
		What's Your Footprint?
		Where Does My Garbage Go?
		Wildlife
		Wildlife CSI

A, Bee, C's of the Honey Bee *SCI 21 ALIVE*
Only female honey bees' sting, honey bees visit at least 2 million flowers to make just one pound of honey and honey bees are responsible for over a third of the food we eat. These are just a few amazing facts this program will present that will have students looking at bees in a whole new way. In addition to facts, this program will cover pollination, anatomy, the honey bee's role in the ecosystem and how important the honey bees are to humans. The current honey bee issues will be addressed and students will have a chance to see all of the equipment beekeepers use as they learn how we get honey from the hive to the jar.

The Amazing Journey of Water *SCI 21 ALIVE*
Students will take an imaginary journey with water in its solid, liquid and gaseous form as it travels around the world. This exercise will help students better understand the water cycle and the changes in the states of water as it moves through the cycle. Through a series of activities using a sponge and a tray of water, students will simulate how wetlands capture, store and release water to learn how important wetlands are to watersheds. The skills students will use include: Observation, gathering information, interpreting, organizing information, measuring, analyzing, comparing and contrasting and relating.

Bat & Moth *SCI 21 ALIVE*
Students will play the role of bats and moths to get an idea of what it would be like to use a sense other than sight to catch prey. In addition to being a sensory game, students will learn about bats and their use of echolocation.

Bat and Moth: An Evolution Arms Race *SCI 21 ALIVE*
Bats and moths are an example of an evolutionary struggle between competing organisms that develop adaptations and counter-adaptations against each other in order to survive. This program will examine the adaptations that bats have developed and how to moth has evolved to detect and evade the moth's strategies. Examples of other species' evolutionary struggles will be presented to illustrate co-evolution and adaptation.

Birds/Raptors *SCI 21 ALIVE*
This program introduces students to the sights and sounds of native birds to help they discover why birds are so unique and important! Through our interactive presentation, they will examine bird adaptations such as beaks and feet and through audio, have a chance to hear bird songs. The program can be concluded with a hands-on feather study, a migration game, or a bird watching hike and I.D. (binoculars provided).

Biography of a Strawberry: A Lesson in Systems Thinking *SCI 21 ALIVE*
This program presents two systems fables: the story of a typical North American strawberry and one of a locally grown strawberry. Both fables are told through a PowerPoint and follow the strawberry from the development of the seed to its planting, growing, picking and shipping to our table. Then the students are asked to compare the resources that go into making each agricultural process happen and the waste that is produced in order to have a better understanding about sustainable food systems.

Biomimicry: The Science of Today and Jobs of Tomorrow *SCI 21 ALIVE*
What do a gecko, a burr, a kingfisher, a termite mound and a lily pad all have in common? They're all examples of things from nature that have inspired people to develop new products to meet human needs. Biomimicry is a new discipline that studies nature's best ideas and then imitates these designs and processes to solve human challenges. Studying a moth eye to invent a non-reflective cell phone screen is an example. In this program we introduce the principles of Biomimicry and the Biomimicry process. In a matching exercise, participants will be asked to match something from nature with a bio-inspired product and then learn about how and why the natural item was used. Using the Biomimicry process, students will walk through a problem humans are currently facing and look for a solution from Nature.

Butterflies *SCI 21 ALIVE*
Students will be introduced to butterflies as they learn about the function of camouflage, warning coloration and flash coloration. They will use their newfound knowledge as they color butterfly cut-outs. These will then be hidden outdoors and students will participate in our version of butterfly "hide and seek". Inside, they will discuss which butterflies were easiest to find and how animals use coloration for self-protection.

Classroom Pond Study *SCI 21 ALIVE*
This program is designed for groups that are unable to travel to Madden. Students will learn what makes a pond a pond and about the amazing process of complete and incomplete metamorphosis. Through the use of samples from the pond at Madden, students will have a chance to get up close with the creatures from the Madden pond, and learn about their role in the pond, to better understand food chains, adaptations, and conditions needed for a healthy pond.

Composting: Nature's Recyclers and Decomposers *SCI 21 ALIVE*
Recycling of paper, bottles, and cans has become part of our culture. Now it is time to take the next step in recycling: school composting. Food leftovers are the single-largest component of the waste stream by weight in the United States. Americans throw away more than 25%of the food we prepare, about 96 billion pounds of food waste each year. We spend about 1 billion dollars a year to dispose of food waste. This program will introduce students to the value of composting. They will about the three different types of composting, and get up close and personal with many of the creatures that turn our food scraps into rich nourishing soil. This program can be taught as an informational program to teach students about composting or as an introduction to creating a composting program for your school. It can be done with one class that would like to start a classroom composting program or with the whole school to set up a school-wide program. For whole schools, our staff can work with your faculty to design a program tailored to your school's needs. This option is available for a special fee.

Crayfish *SCI 21 ALIVE*
There are over 500 different species of crayfish and about 350 of those are found in the United States! Besides being a food source crayfish are also an indicator of the health of streams, ponds, and rivers. Students will explore the basic anatomy, life cycle, and importance of crayfish through slides, artifacts, and hand-on activities.

Examining Invasive & Native Competition *SCI 21 ALIVE*
The health of our planet depends on a delicate balance of species. Humans are part of this balance but unfortunately our actions sometimes tip the scale. When we move plants to different regions, either intentionally or unintentionally, we introduce the native plants to a new competition. This program will begin in the classroom with an examination of examples of plant competition. Then we will head out to your school grounds where we will identify native and invasive species and do population counts. Finally we will chart and graph the data we collected and discuss possible future ramifications, trends and remediation techniques.

Fearsome Predator: Separating Fact from Fallacy *(Available as an evening program) SCI 21 ALIVE*
The word predator can evoke feelings of fear and even disgust, but who are the predators and what is their role? In this 90-minute program taught by a CEE Environmental Educator, students will learn the answers to these questions and more as they examine why people fear predators and why we should care about them. They will understand what happens when predators are eliminated from their ecosystems and what is being done to protect them. During the program, students will come face to face with Atka, an Arctic wolf from the Wolf Conservation Center located in South Salem, NY, as well as BOCES's birds of prey and snakes.

This assembly program is available as an in-school program at your school as well as an evening program at a residential/ overnight facility.

Food Webs *SCI 21 ALIVE*

This interactive program introduces students to learn about the daily flow of energy from the sun to producers and consumers. We will provide examples of both balanced and unbalanced food chains. After exploring a pond, field or forest ecosystem, students will participate in various activities and games that allow them to put their newly acquired knowledge to the test. Can they balance a food pyramid? Can they escape a hawk before becoming dinner? If they become dinner, will they decompose and become a new producer? Through these games they will come to understand how all parts of a web are interconnected and how vital each is to the survival of the ecosystem.

Food Webs: Energy Transfer *SCI 21 ALIVE*

This interactive program introduces students to learn about the daily flow of energy from the sun to producers and consumers. We will provide examples of both balanced and unbalanced food chains. After exploring a pond, field or forest ecosystem, students will participate in various activities and games that allow them to put their newly acquired knowledge to the test. Can they balance a food pyramid? Can they escape a hawk before becoming dinner? If they become dinner, will they decompose and become a new producer? Through these games they will come to understand how all parts of a web are interconnected and how vital each is to the survival of the ecosystem.

Forest Ecology *SCI 21 ALIVE*

The Forest Ecology program is focused on a guided hike through the Madden property or a local nature trail. Using interpretive stops, games, and 'hands-on' activities, the students will be introduced to the temperate forest and the relationships between the habitat and its inhabitants. This program can be adapted to any grade level and many focus areas including: food chains, human impact, sustainable management, problem solving, maple sugaring (spring only), living and non-living things, and wildlife. A forest ecology program can also include a plot study, forest measurements, and tree identification.

Forest Measurements/Plot Study *SCI 21 ALIVE*

Trees come in all shapes and sizes and are an excellent tool for a mathematical exercise! Students will measure trees to become familiar with the tree structure as they learn the importance of measuring techniques and standard units of measurement. Activities will vary based on the grade level. Tools and skills include: Biltmore stick, ruler, diameter tape, and pacing.

Geology: Rockin' the Valley/Earth Science: Rocks & Minerals *SCI 21 ALIVE*

Is a rock really just a rock? During this program we will explore the differences between the three types of rocks: sedimentary, igneous and metamorphic. We will take an up close look at the fascinating differences between these varied rocks and what made them what they are today. Through geological history and science experiments we will determine why limestone turns to dust and bubbles, how water is actually stronger than a rock, where we get those amazing stones to polish our feet and delve into what truly makes a rock crumble!

This program consists of a 20-30 minute informational presentation followed by a hands-on rock identification investigation using a key, a tectonic plate movement and rock striation demonstration and a water filtration and erosion demonstration.

The program could be taught in two ways:

1. A 30-minute assembly at the beginning of the day for the entire grade level that provides introductory information. Then the rest of the day will be spent visiting each individual class for 30-minutes to lead the hands-on component.
2. A 60-minute presentation with individual class that will include both the introductory information and the hands-on component.

Hibernation/Winter Adaptations *SCI 21 ALIVE*
Students will learn how and why New York State wildlife adapts for the winter months through the use of live animals, furs and skulls. They will also gain a better understanding of the insulation quality of blubber when they try on our blubber glove. Elementary students will play the Bear Adaptation Game. For higher levels, this program can incorporate problem solving, ecological sciences, physical adaptations, and climatology. Please indicate if you would like to hold the program indoors or outdoors.

How Beavers Built the Hudson Valley *SCI 21 ALIVE*
The ingenious beaver played an important role in the economic, cultural and ecological development of the Hudson Valley that can still be seen today. This program will use furs and skulls to introduce students to the beaver and what made its pelt so valuable. We will examine chew patterns to understand the beaver's unique ability to alter its environment. Then through a PowerPoint, we will examine the beaver's place in the Hudson River's ecology; how the beaver trade influenced the relationship between the colonists and the Native Americans; the impact of the beaver trade on the local tribes, why the beaver is on the official seal of New York City; the impact of their decline on the 18th century economy as well as the environment of the Valley and how their return has had both positive and negative impacts for residents of the Hudson Valley.

Hudson River *SCI 21 ALIVE*
The Hudson River has played a dominant role in the history of New York State. Through discussion and slides, this program will explore the history and ecology of the Hudson River. Special emphasis is placed on the river's ecological problems, the condition of the river today, current events, and the future of the Hudson. Through hands-on activities and demonstrations, students will actualize their role as caretakers of the Hudson River Watershed and understand the effects of pollution on the aquatic and terrestrial life in and around the Hudson.

Multiple Perspectives: If the World Were a Village *SCI 21 ALIVE*
Here in America, we are so used to our convenient lifestyles; turning on the switch and knowing that there will be electricity, hopping in the car and going out to eat, or taking in a movie. Most young people don't even consider that there are people who eat dairy once a week and feel lucky when they have meat once a year. In this program we will use engaging activities incorporating illuminating images and revealing data from the books, *What the World Eats*, *Material World* and, *If the World Were a Village* to give your students multiple perspectives, help them examine their assumptions and expectations about their lifestyles, help them see themselves as global citizens, and understand how different their lives are from their peers in other countries.

I'm Only One Person, What Can I Do? (Assembly) *SCI 21 ALIVE*
This assembly program is a fast-paced, interactive look at the pressing issues of consumerism, solid waste and energy use. Students will learn about the attitudes that got us into this mess and the natural laws which guide how our planet operates. Then using the issue of trash we will examine behaviors based on the old attitudes and how to change those behaviors so they align with the natural laws. The second part of the presentation examines how we use energy. Students will participate in an energy quiz and then look at new energy saving behaviors. Examples of new more sustainable products are used throughout the presentation.

I'm Only One Person, What Can I Do? (Classroom Program) *SCI 21 ALIVE*
This program takes an in-depth look at the pressing issues of consumerism, solid waste and energy use. The program will begin with a discussion of how our attitude, behaviors and habits are formed and how they impact our decisions. Through discussion and demonstration, participants will learn about simple changes they can make in their homes and lives that will have a positive impact on our planet. The goal of this program is to empower students, giving them strategies for educating their

Insects: Incredible Creatures *SCI 21 ALIVE*
Did you know that there are more than a million different kinds of insects on our planet!? Through slides and hands-on activities, students will learn the specific characteristics that entomologists use to identify insects, and their relative, the spider. Every student will become an "amateur entomologist" as they learn about simple and complete metamorphosis, the difference between pests and helpful insects, and what role these insects play in our environment!

Introduction to Sustainability *SCI 21 ALIVE*
Sustainability is a word that has quickly become a part of our daily lexicon. But what does it mean and what does it mean for each of us? We will begin by learning about the mental models we as a society have been operating under for the past one hundred years and how these attitudes have formed our behaviors. We will then examine some daily behaviors and choices we all make each day from a systems perspective and track the resources used and pollutants produced using marbles. Next we will learn about the natural laws that guide our planet and go back to reexamine the behaviors and choices through these laws to determine if the resources and pollution produced has changed. After comparing the usage results, we will learn about how to create behavior change and new habits.

Into the Great Unknown: What Happens to My Recyclables? *SCI 21 ALIVE*
Recycling is something that is familiar to almost everyone, but when an item goes into the bin, what happens to it? This program will give your students a better understanding of the route a recycled item takes to become a new item, some of the new (and old) products being made with recycled content, and what additional advantages they offer in terms of sustainability. This program will also examine some examples of solid waste found in our home and workplace that can be kept out of the waste stream altogether.

Keep in Touch *SCI 21 ALIVE*
In this sensory program, students will explore four of our five senses (we save taste for lunch time) through various interactive activities. The activities include touching a mystery object in a box or bag and then describing the object using descriptive words, smelling various smell jars to identify the item in the jar, using insect viewers and rainbow glasses to view the classroom and, listening the sounds of common animals made by their classmates make and trying to identify the animal makes that sound. Then, using pictures, live animals, and pelts, they will learn how some common animals use their senses.

Mammals of New York State *SCI 21 ALIVE*
Students will connect to nature more closely as they discover the native mammals of New York State. Through hands-on furs and skulls students will come to understand basic needs and characteristics of a mammal as well as predator/prey relationships, food chains and animal adaptations. This program can take place indoors or outdoors.

Mapping Your School's Ecological Resources *SCI 21 ALIVE*
After a brief introduction about how scientists calculate animal and plant populations, we will go outside and do a random sampling of the animals and plants found on your school grounds. The outdoor activity will include mapping, how to calculate estimates and the natural services provided by the flora and fauna found.

Marine Ecosystems *SCI 21 ALIVE*
75% of the earth's surface is covered in water! Learn with your students about the different marine ecosystems and the life that inhabit our oceans. From the beach down to the deep hydrothermal vent communities, using shells, plants and preserved specimens; models, colorful slides and real life stories, participants will learn about the animals and plants that live there, why the ocean is important to us, how humans are impacting the ocean and much more.

Nature Activities to Reconnect with Our Natural World *SCI 21 ALIVE*
Nature Deficit Disorder, not here! We will take your students outside to learn and connect with our natural world through a series of fun and educational nature games! This program can complement almost any area of focus from predator/prey relationships, camouflage, trees, or animals. Just let us know what you are studying!

Nature Scavenger Hunt *SCI 21 ALIVE*
Students will become detectives by using their five senses and special detective skills to search for a number of items. Following the search, a discussion will focus on the role of these items and how they fit into our ecosystem.

Nocturnal World of New York *SCI 21 ALIVE*
In this unique program, students will learn all about nocturnal animals of New York State. The program will use sounds to help students identify birds, amphibians, and mammals that live in the wild areas of New York and in their own backyards! Games will help them experience the varied senses used by nocturnal creatures before they have an up-close encounter with some live animals! This is a wonderful opportunity for students to enhance their auditory learning skills.

Oil Spills: Where Did the Oil Go? *SCI 21 ALIVE*
Some 206 million gallons spilled into the Gulf of Mexico over a period of 86 days in the spring and summer of 2010. Today there is no oil to be seen. Where did it go? This program will examine some of the ways nature is helping to clean up some of the oil through the molecular and microbial food web. We will also look at places where hidden oil is being found such as wetlands and deep in the Gulf and its impact on those ecosystems as well as human health.

Orienteering *SCI 21 ALIVE*
During this full day program at Madden, students begin by learning the parts of a compass and how to use it. To reinforce their navigation skills, they will play the compass circle game and then learn how to measure distances through the use of pacing. After lunch, students are taught to use their newly acquired skills to orienteer and are sent out on the orienteering trails that crisscross through the woods.

Owl Pellet Study *SCI 21 ALIVE*
Owls are very unique birds that inhabit the nocturnal world. In this fascinating study of owls, students are introduced to the sights and sounds of all the different owls that live in New York State. They will also study the special adaptations owls have for hunting at night and their unique digestive system. Students will have the opportunity to dissect an owl pellet and discover what their owl had for dinner, and meet one of our resident ambassador owls! The material fee for this program is $2.00 per student.

Pollinator Partnerships *SCI 21 ALIVE*
In this program, we will introduce your students to the important interactions between plants and pollinators. Through our interactive presentation, students will become experts on butterflies, hummingbirds, bees and bats by investigating how they are specially adapted to pollinate certain flowers. After exploring the various pollinator adaptations, we can either head outside to explore your school garden or woods to look for signs of pollination or, play an interactive pollination tag game on your school's field.

Pond Ecology (spring only) *SCI 21 ALIVE*
Students will begin by examining the differences between a pond and a lake, before going outside to visit the Madden pond! Here, they will use scoop nets to catch samples of the animals and insects living there. Following the collection period, the group will identify and observe their catch, learn about food chains, and the conditions necessary for a healthy pond. If you

Seed Study *SCI 21 ALIVE*
Through seed sorting and critical thinking, students will learn the differences between a seed and a non-seed in this fun, interactive program! The lesson will also include the parts of a seed and all of the different ways seeds travel. After investigating many different types of seeds, students will play a game where they find out how hard it is for seeds to grow, and why they are so valuable and special for the natural world.

Skull Study *SCI 21 ALIVE*
This program uses hands-on activities that emphasize critical thinking skills. It begins with a presentation which focuses on animal survival adaptations. Then, using skulls of endangered species and local animals, students will be asked to make observations of eye location, nasal passageways, and teeth configuration to draw conclusions and identify facts about each animal. In the last part of the program, students will be divided into groups to identify/create their own animal based on the skull assigned to them for study.

Soil - The Basis of Life *SCI 21 ALIVE*
From the food we eat and the clothes we wear, to the air we breathe, humanity depends upon the dirt beneath our feet. It nurtures life, supports cities, forests and oceans and feeds all terrestrial life on Earth. Soil could arguably be called Earth's most critical resource. Yet it is a substance few people understand and most take for granted. Somehow "dirt" has acquired a bad reputation. What is dirt? What is its role? Who lives there?
Where does it come from? What is its role in the carbon cycle? What does it feel like? What does it smell like? From its remarkable properties to its critical ecological importance, the dirt under our feet is a goldmine of scientific wonderment. Come along and get your hands dirty in this program that is part biology, part chemistry and part CSI. We guarantee you and your students will never think about dirt in the same way again.

Supermarket Botany *SCI 21 ALIVE*
What makes a seed a seed? What is the life cycle of a plant? Which parts of the plant are the best to eat? All of these questions will be examined as well as many more as we take a trip to the supermarket right in your own classroom. Students will draw the parts of a plant and illustrate the plant's life cycle. Through games and activities, students will learn all about the science of botany and will never look at the produce isle the same way again!

Tree Life Cycle *SCI 21 ALIVE*
In this activity, students will learn about the two life cycles of a tree; life cycle and seasonal cycle. After an interactive presentation on these cycles, students will be given the opportunity to explore all of the parts of a tree from the leaves, to the trunk and even have an opportunity to count the annual rings in a tree "cookie." Students will never look at a tree the same way again.

Tropical Rainforests *SCI 21 ALIVE*
Tropical Rainforests are the oldest and most diverse ecosystems on our planet today! They are home to more than half of our plant and animal species in the World, yet tropical deforestation is occurring at a rate of over 20 million acres of forests each year. Through discussion, slides, and visuals, students will visit the rainforest and discover some of the plants and animals that live in each layer of this diverse habitat. Then, students will become biologists and discover their own unknown species from the rainforest. They will learn about the threats of poaching and loss of habitat to animal species and be empowered to become active in saving what is left of this precious ecosystem.

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Turtles, Frogs, Toads, Snakes, What's the Difference? *SCI 21 ALIVE*
Turtles, frogs, toads, snakes, what's the difference!? This class will answer the question as it examines the major differences between amphibians and reptiles. The characteristics of the two classes as well as the various biological adaptations of several species will be discussed. Students will also be introduced to the various snakes of the region, learn about their physical characteristics and the difference between venomous vs. non-venomous snakes in our area before they have an up-close encounter with some live animals!

Understanding the Commons *SCI 21 ALIVE*
Healthy Commons such as air, biodiversity, climate regulation, our collective future, water, libraries, public health, heritage sites and top soil, are what we all depend on and for which we are all responsible. Through a series of activities, this program will introduce students to the concept of the commons, their value and importance in our lives and for our future. Together the group will establish a list of responsibilities, behaviors and actions to care for the Commons.

Understanding the Consequences of Ecosystem Manipulation *SCI 21 ALIVE*
The health of our planet depends on a delicate balance of species. Humans are part of this balance but unfortunately our actions sometimes tip the scale. When we move plants to different regions, either intentionally or unintentionally, we introduce the native plants to a new competition. This program will begin in the classroom with an examination of examples of plant competition. Then we will head out to your school grounds where we will identify native and invasive species and do population counts. Finally we will chart and graph the data we collected and discuss possible future ramifications, trends and remediation techniques.

We All Live in a Watershed *SCI 21 ALIVE*
This program will help students understand the importance of watersheds in their community. Hands-on activities, such as creating a watershed in a bowl, “Who Dirtied the Watershed”, and using a watershed model and an erosion model, will help to demonstrate the properties of water, the components of the hydrologic cycle, and the impact of pollution. The program will end with a discussion of human impact on aquatic environments and what each individual can do to make a difference!

Weather SCI *21 ALIVE*
Rain, sleet, snow, humidity, muggy, what does it all mean!? This program will introduce the concepts and tools necessary to understand the weather. Students will learn how to understand the weather forecast, to use simple predicting devices, how the water cycle works, and different cloud types. They will leave the program feeling like amateur meteorologists! The program starts indoors and culminates in an outdoor collection of data to create our very own weather forecasts!

What’s Your Footprint? *SCI 21 ALIVE*
The purpose of this program is to help students begin to think about how their lifestyle impacts our planet by using the Ecological Footprint. The Ecological Footprint is a measure of the amount of nature it takes to sustain a given population over the course of a year. Through the use of a short presentation, an Ecological Footprint questionnaire and classroom activities, students will identity the resources, processes, and impacts embodied in everyday activities and describe the interconnectedness of population, lifestyle, economics and environmental issues. Together the group will then generate a list of mitigating behaviors and plug them into an on-line footprint calculator to help them understand the impact of individual behavior so they can begin to decide what lifestyle changes they can make.

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Where Does My Garbage Go? *SCI 21 ALIVE*
Lunch is over and your students are anxious to get outside for recess. They clear off their tables, and toss their uneaten food, paper napkins and cups, and plastic utensils into the nearest trash can. But where does it go from there? The average American generates approximately 6 pounds each of trash per day! There's everything from paper, uneaten food, construction leftovers, cut grass, plastic, glass, metal, old batteries, computers, phones, and tons of other stuff. Come take a journey with your garbage to learn where it goes and along the way encounter a waste-to-energy incinerator, landfills, a recycling plant and composting. SCI 21 5/4, 6/1, 4

Who Eats Who? *SCI 21 ALIVE*
Carnivores, herbivores, omnivores; who eats whom? After learning how to classify animals based on what they eat, students will identify a number of food chains and play a food chain game. These games will illustrate the flow of energy as food is consumed throughout a food chain and the delicate balance of a healthy food chain.

Wildlife SCI *21 ALIVE*
All children enjoy learning about animals! This program explores what beavers eat and how they keep dry, why the fox uses camouflage for protection and more. The classification system of animals, animal habitats, and animal adaptations are among the topics that will also be discussed. Through demonstrations and activities using pelts, skulls, and a cold-blooded friend, students will become wildlife experts! For older grades, slides will illustrate a larger range of wildlife, including threatened and endangered species.

Wildlife CSI *SCI 21 ALIVE*
Coyotes, turkeys, raccoons, owls, bobcats, and thousands of other New York wildlife are impressive sights to observe in the natural world. Unfortunately, for the curious eye, some of these animals are also some of the most reclusive wild creatures. Luckily, they leave clues behind for anyone to discover. Students will study scat, tracks, food remains, feathers, fur, and real crime scenes how to discover wildlife in a case of who-done-it. Join us to seek out these wild signs, which can trace the sometimes harsh realities of the food chain suitable only for a wildlife crime scene investigator!