



School Program Name:	Ecosystem of the Vernal Pool
Name of Sanctuary:	Moose Hill Wildlife Sanctuary
Grade Level:	Grades 3 – 5
Location Options:	At the sanctuary or your site
Time:	2 hours or combine with a second program for a full-day field trip
For more info:	moosehilledu@massaudubon.org

Program Description

Explore pool edges for signs of amphibians, study water samples in search of insect larva, and determine what makes up the food chain of this ecosystem. This program is designed to be paired with our “Pond in the Classroom” program.

Significant savings are offered when you select a second program to create a full-day of hands-on learning at Moose Hill. This program combines well with Habitat Hunt and Insect Safari. Because of our large trail system and full-day option, we can serve up to 130 students for many programs. We provide a ratio of one Moose Hill teacher-naturalist to 12 to 14 students.

Massachusetts State Curriculum Frameworks

Subject:	Science and Technology
Topic:	Life Science

Learning Standards

Characteristics of Plants and Animals

3-5 Life Science #1: Classify plants and animals according to the physical characteristics that they share.

Structures and Functions

3-5 Life Science #3: Recognize that plants and animals go through predictable life cycles that include birth, growth, development, reproduction, and death.

3-5 Life Science #4: Describe the major stages that characterize life cycles

3-5 Life Science #5: Differentiate between observed characteristics of plants and animals that are fully inherited (e.g., color of flower, shape of leaves, color of eyes, number of appendages) and characteristics that are affected by the climate or environment (e.g., browning of leaves due to too much sun, language spoken).

Adaptations of Living Things

3-5 Life Science #7: Give examples of how changes in the environment (drought, cold) have caused some plants and animals to die or move to new locations (migration).

3-5 Life Science #8: Describe how organisms meet some of their needs in an environment by using behaviors (patterns of activities) in response to information (stimuli) received





from the environment. Recognize that some animal behaviors are instinctive (e.g., turtles burying their eggs), and others are learned (e.g., humans building fires for warmth, chimpanzees learning how to use tools).

3-5 Life Science #10: Give examples of how organisms can cause changes in their environment to ensure survival. Explain how some of these changes may affect the ecosystem.

Massachusetts State Curriculum Frameworks

Subject: Science and Technology

Topic: Earth Science

Learning Standards

The Water Cycle

3-5 Earth Science #10: Describe how water on earth cycles in different forms and in different locations, including underground and in the atmosphere.

Massachusetts State Curriculum Frameworks

Subject: Science and Technology

Topic: Physical Science

Learning Standards

3-5 Physical Science #3: Describe how water can be changed from one state to another by adding or taking away heat.

Massachusetts State Curriculum Frameworks

Subject: Arts

Topic: Visual Arts

Learning Standards

Observation, Abstraction, Invention, and Expression

PreK-12 Visual Arts #3: Students will demonstrate their powers of observation, abstraction, invention, and expression in a variety of media, materials, and techniques.

Massachusetts State Curriculum Frameworks

Subject: English Language Arts

Topic: Language

Learning Standards

Discussion

PreK-12 Language #1: Students will use agreed-upon rules for informal and formal discussions in small and large groups.

Questioning, Listening, and Contributing

PreK-12 Language #2: Students will pose questions, listen to the ideas of others, and contribute their own information or ideas in group discussions or interviews in order to acquire new knowledge.



Vocabulary and Concept Development

PreK-12 Language #4: Students will understand and acquire new vocabulary and use it correctly in reading and writing.

Lesson Objectives

Students will know and be able to:

- Identify the characteristics of life found in a vernal pool; both amphibian and arthropod.
- Identify the type of animal discovered at the vernal pool using identification guides.
- Match larva and adult forms of arthropods when shown images of the animal.
- Understand how vernal pools are affected by the season and the weather.

Vocabulary

vernal pool	ecosystem	arthropod
larva	nymph	adult
amphibian	metamorphosis	insect
arachnid	crustacean	evaporate

Assessments

How will the Mass Audubon educator know that the students have met the standards?

- Mass Audubon educator will observe students exploring, observing, and identifying aquatic life at the vernal pool and lab station.
- Students will participate in answering teacher prompted questions.
- Students will demonstrate their understanding of aquatic life in the vernal pool by participating in a wrap-up activity.

Summarizer

How will the Mass Audubon educator close the lesson to see if students met your objective?

- Students will be actively searching for and identifying aquatic life at the lab station as well as at the edge of the vernal pool.
- Students will participate in creating a food chain using the animals they have found in the vernal pool ecosystem.
- When shown a picture of an aquatic animal, students will be able to identify if it is an amphibian or arthropod: insect, arachnid, or crustacean.



Mass Audubon School Programs

At Mass Audubon we strive to create learning experiences that are enriching, innovative, meaningful, and engaging. All our school programs are aligned with Massachusetts Curriculum Frameworks. Our network of wildlife sanctuaries and nature centers located in urban, suburban, and rural communities around the state enable us to have strong relationships with local schools.

Our Education Foundations

- Place-based education is an educational philosophy that connects learning to what is local for an individual. We help build conservation communities, working with students and teachers in cities and towns to develop place-based environmental education that is linked directly to their home community.
 - Inquiry-based learning is focused on teamwork, being learner-centered, questioning ourselves and the world around us, providing a more focused, time-intensive exploration, promoting lifelong learning, communication, and learning as fun.
 - We are fully committed to creating a positive and supportive environment for all learners.
 - We strive to be culturally sensitive, recognizing and embracing cultural differences.
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Differentiated Instruction

- We strive to create a positive learning environment that is inclusive, supportive to all learners, and sensitive to cultural diversity.
 - Outdoor classroom experiences are structured to meet the needs of the particular learners.
 - Students work in small groups using hands-on materials.
 - A variety of educational media are used, including colorful illustrations.
 - With advance notice, efforts will be made to accommodate all learning styles and physical needs.
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Notes

- Nature exploration is dependent upon the weather and other conditions. A class might observe different wildlife than they expected to see. An outdoor lesson can sometimes provide unexpected, but enriching teachable moments on a natural history topic that was not planned.
- Mass Audubon nature centers each have a unique landscape and will customize programs to work best at their particular site.
- Our lessons can be adapted to incorporate a classroom teacher's needs when given enough notice.

