



**School Program Name:** Freshwater Ecology  
**Name of Sanctuary:** Broadmoor Wildlife Sanctuary  
**Grade Level:** 6-8  
**Location Options:** This program occurs at the Sanctuary  
**Time:** 2 hours  
**For more info:** [broadmoorschool@massaudubon.org](mailto:broadmoorschool@massaudubon.org)  
508-655-2296 x7304

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## Program Description

Students will explore a freshwater environment as an ecosystem, considering biotic and abiotic factors, relationships in nature and how organisms fill various niches. They will use microscopes to look at macro-invertebrates and plants collected from the water, focusing on evolution, adaptations and classification. Students also consider complex avenues for energy to transfer from the sun through living things in this environment.

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## Massachusetts State Curriculum Frameworks

**Subject:** Science and Technology  
**Topic:** Life Science  
**Sub-Topic:** Classification of Organisms  
Living Things and Their Environment  
Energy and Living Things  
Changes in Ecosystems over Time

## Learning Standards

### Classification of Organisms

6-8 Life Science #1: Classify organisms into the currently recognized kingdoms according to characteristics that they share. Be familiar with organisms from each kingdom.

### Living Things and Their Environment

6-8 Life Science #13: Give examples of ways in which organisms interact and have different functions within an ecosystem that enable the ecosystem to survive

### Energy and Living Things

6-8 Life Science #14: Explain the roles and relationships among producers, consumers, and decomposers in the process of energy transfer in a food web.

6-8 Life Science #15: Explain how dead plants and animals are broken down by other living organisms and how this process contributes to the system as a whole.

6-8 Life Science #16: Recognize that producers (plants that contain chlorophyll) use the energy from sunlight to make sugars from carbon dioxide and water through a process called photosynthesis. This food can be used immediately, stored for later use, or used by other organisms.

### Changes in Ecosystems Over Time

6-8 Life Science #18: Recognize that biological evolution accounts for the diversity of species developed through gradual processes over many generations.



## Massachusetts State Curriculum Frameworks

- Subject:** English Language Arts  
**Topic:** Language  
**Sub-Topics:** Questioning, Listening, and Contributing Writing

## Learning Standards

### 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.

## Lesson Objectives

What will students know and be able to do? These objectives must be observable and measurable.

Students will know and be able to:

- Describe physical and behavioral characteristics of at least one aquatic invertebrate.
- Distinguish between otter skull, beaver skull; identify adaptations of each.
- Identify two plants in the marsh and describe how they survive in water.

## Vocabulary

Ecology	Energy flow	Niche
Adaptation	Photosynthesis	Parasitism
Biotic	Consumer	Mutualism
Abiotic	Producer	Competition
	Decomposer	

## Assessments

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

- Mass Audubon educator will observe students exploring, observing, and classifying organisms.
- Students will participate in answering teacher prompted questions.
- Students will demonstrate their understanding of a freshwater body by participating in a wrap-up activity, which may include a worksheet.

## Summarizer

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

- Students will share one thing they have learned during the lesson or that was new and exciting for them.



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## 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.

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## 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.

