Mass Audubon
Protecting the Nature of Massachusetts

School Program Name:	Trees
Name of Sanctuary:	Habitat Education Center & Wildlife Sanctuary
Grade Level:	3-5
Location Options:	multiple sessions both in-class and in the field
Time:	Class sessions (2) 1 hour Field sessions (2) 2.5 hours
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Program Description

Through this series of four interactive sessions, students will examine the fundamentals of tree ecology in the classroom and in the field. During classroom sessions students will examine and classify specimens, investigate hands-on with microscopes and hand lenses, and apply knowledge in role-play activities. In field science sessions students will have the opportunity to explore in small groups, think critically about the workings of an ecosystem, and apply learned concepts and vocabulary in the context of forest, pond, and meadow habitats.

Massachusetts Curriculum Frameworks

Framework:	Science and Technology
Strand:	Life Science
Topic:	Characteristics of Living Things Adaptations of Living Things Energy and Living Things

Learning Standards

3-5 Life Science #2:	Identify the structures in plants (leaves, roots, flowers, stem, bark, wood) that are responsible for food production, support, water transport, reproduction, growth, and protection.
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).
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 #9:	Recognize plant behaviors, such as the way seedlings' stems grow toward light and their roots grow downward in response to gravity. Recognize that many plants and animals can survive harsh environments because of seasonal

behaviors, e.g., in winter, some trees shed leaves, some animals hibernate, and other animals migrate.

3-5 Life Science #11: Describe how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred within a food chain from producers (plants) to consumers to decomposers.

Massachusetts Curriculum Frameworks

Framework: Science and Technology
Strand: Life Science
Topic: Earth Science

Learning Standards

3-5 Earth Science #4: Explain and give examples of the ways in which soil is formed (the weathering of rock by water and wind and from the decomposition of plant and animal remains).

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:

- Identify the parts of a tree and their functions.
- Describe the basic process and function of photosynthesis.
- Compare and contrast different types of bark, tree shapes, leaves, cones/berries/fruit (How different trees reproduce.)
- Apply knowledge of concepts while examining tree specimens in the context of the field.
- Explore the interconnectedness of trees and other organisms in the habitat. (shelter, food source, soil)
- Think critically about different habitats and situations where trees may or may not get their basic needs met.

Vocabulary

photosynthesis, conifer, deciduous, smooth, toothed, lobed, parallel, palmate, heartwood, sapwood/xylem, cambium, inner bark/phloem, bark, decomposer

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Assessments

How will you know that the students have met the standards?

- Students will respond to inquiry based assessment.
- Activities such as "Build a Tree" and "Maple Seed Mix-Up" require students to utilize and apply knowledge of concepts that are introduced. Back to back leaf drawings give students a chance to select appropriate vocabulary to describe attributes of leaves.
- Critical thinking questions that give students an opportunity to make connections and synthesize what has been retained. For example "How do you think would a maple tree fare in this location? How is this habitat different from where we have seen this type of tree grow earlier today? How does the presence of trees affect this ecosystem?"

Summarizer

How will the Mass Audubon Educator close the lesson to see if students met the objectives?

Session 1, in class,- Give each student a specimen that they can share as many scientific details about that they can, using vocabulary addressed in lesson.

Session 2, in the field- Depending on the program and what students have experienced, locate trees that are (utilize vocabulary or adaptation concepts)…deciduous, conifer, has toothed leaves, produces nuts, has been affected by changes in the environment (for example; have been able to sprout because a tree has fallen and sunlight is able to reach the forest floor.)

Session 3, in class- How might your schoolyard/neighborhood be different for trees than the wildlife sanctuary? Competition, diversity, ability to withstand difficult conditions…

Session 4, in the field- Describe how trees play an integral part in the ecosystem. How are the trees in this habitat helping a squirrel, a worm, etc. Make connections and apply knowledge.

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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.

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.

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.

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.