Mass Audubon
Protecting the Nature of Massachusetts

School Program Name:	**Adaptations and the Food Web**
Name of Sanctuary:	Moose Hill Wildlife Sanctuary
Grade Level:	Grades 6 – 8
Location Options:	At the sanctuary or your site
Time:	2 hours or combine with another program for a full-day field trip
For more info:	moosehilledu@massaudubon.org

Program Description

Compare mammal skulls and determine the adaptations that have allowed the animal to survive as a predator or prey. Learn how to hypothesize an animal's diet from knowledge of its teeth and use your observation skills to identify an unknown skull. Enjoy a short hike while looking for signs left behind by primary and secondary consumers, determine the food chains involved, and link these chains to create the diverse food web of this ecosystem.

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 the Changing Ecosystems or Weather and Climate programs. 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

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.

Evolution and Biodiversity

6-8 Life Science #10: Give examples of ways in which genetic variation and environmental factors are causes of evolution and the diversity of organisms.

6-8 Life Science #11: Recognize that evidence drawn from geology, fossils, and comparative anatomy provides the basis of the theory of evolution.

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.

Mass Audubon
Protecting the Nature of Massachusetts

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.

Subject: Comprehensive Health

Topic: Personal & Community Health

Ecological Health

PreK-12 Health #13: Students will gain knowledge of the interdependence between the environment and physical health, and will acquire skills to care for the environment.

Subject: English Language Arts

Topic: Language

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:

- Recognize physical characteristics of herbivore and carnivore skulls and dentition (teeth).
- Compare skull and teeth adaptations of herbivores and carnivores, and hypothesize about the animal's diet.
- Identify an unknown skull based upon knowledge of comparative anatomy of the physical adaptations found in herbivore and carnivore skulls.
- Explore signs of primary and secondary consumers in the meadow (as they relate to anatomy and function) and determine food chains, linking them to make diverse food webs
- Play a game that demonstrates energy transfer within a food chain and the effort (work) animals in each level of the chain use to meet their energy needs
- Understand vocabulary words and be able to differentiate between those that appear similar.

Vocabulary

Adaptation	Comparative anatomy	Physiology/function	Dentition
Evolution	Hypothesize	Biodiversity	Omnivore
Food web	Producers	Primary consumers	Secondary consumers
Energy transfer	Decomposers	Ecosystem	

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 skulls and teeth adaptations of known herbivores and carnivores.
- Students will demonstrate their understanding of comparative anatomy by using observational skills and skull diagrams to identify an unknown skull.
- Students will participate in answering teacher prompted questions.
- Mass Audubon educator will observe students exploring, observing, and identifying animal signs and hypothesizing which animals made the signs.
- Students will demonstrate an understanding of the food web by placing herbivores into the category of primary consumer and carnivores into the category of secondary consumer.

Summarizer

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

- When shown actual skulls of herbivores and carnivores, students will be able to identify the characteristics of each, compare these characteristics, and devise a hypothesis that determines the anatomy and function of a omnivore's skull and dentition.
- As a group, the students will participate in a food chain relay game and be able to determine the roles of herbivores, carnivores, and omnivores in a food chain, differentiate between the varying levels of consumers, and construct and describe a detailed food web.

Mass Audubon
Protecting the Nature of Massachusetts

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 when given enough notice.