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Plant and Animal Interactions

Grades 3-5 Program Suggestions

Our upper elementary naturalist programs are all about investigating the relationships between plants, animals, and their habitats. Below is a list of potential programs for grades 3-5 with *suggested* locations and seasons for each program. Please keep in mind that all programs can be modified to fit your school's curriculum goals and the learning interests of your classroom. If you are unable to come to Manomet, we can always find a way to bring programming to your school in-person or virtually!

We recommend combining **Songbird Science** with one of our **Stewardship Nature Walks**; however, programs can be mixed and matched in any way.

	Program Description	Location			Season	
		Manomet	Greenspace	Classroom	Fall	Spring
Songbird Science	Students will take on roles as banding lab scientists as they learn how we use mist nets and bird banding to study birds! They'll retrieve and identify a realistically sized and weighted model bird from a net. They'll weigh their model to assess its health, and relate health to feeding strategy, bird form and function, and habitat use. We'll compare feeding strategies between species, with a focus on adaptations and seasons. Students will band their bird, or use color codes to interpret existing bands to figure out where their bird has been in the past. We'll use a migration game to connect what we have learned about birds in Massachusetts with the needs of those same birds at different places along their migration path. Finally, our student scientists will interpret graphs showing population trends based on Manomet's 50+ year banding dataset. Working in small groups, students will report to their peers on population change over time, and construct explanations for these trends based on what they have learned about bird biology, migration, and environmental change. We'll discuss how human activity affects bird populations both here in Massachusetts and elsewhere, and ways that families can support migratory birds at their schools and in their back yards! **The experience will culminate with a visit to the Manomet banding lab* – in person or virtual – to meet some live birds and see their adaptations in real life!**					
Plants & Pollinators	Students will participate as Manomet environmental scientists as they explore the important relationship between pollinators and the plants they are pollinating! Students will collect data to document the abundance of different types of pollinators visiting local flower patches and identify what types of flowers they are visiting. Manomet is currently working to increase pollinator diversity and abundance on the property, and we will use student-collected data to help us see whether we are succeeding! At the end of the survey, students will contribute their data and we will work together to make a graph and interpret our findings. We will discuss the mutualistic relationship between pollinators and the plants they are pollinating and why this is so important to ecosystems! Students will then share what their data tells us about our study site and discuss their findings as a group. *Optional: it may be possible to arrange a visit with a local beekeeper as part of this activity.*					
Food Webs & Frass	Student ecologists will investigate the food web at Manomet (or a local greenspace) during a caterpillar hunt! We'll use a kinesthetic food web activity to brainstorm ways that local plants and animals are connected, and then focus in on the key ecological role of caterpillars. We'll look for evidence of caterpillar grazing on plants by collecting caterpillar frass (poop) in different habitats, and by looking at leaves for evidence of caterpillar grazing (and for caterpillars themselves!). We'll also look for likely caterpillar predators and consider how a caterpillar might try to protect itself. Student data on caterpillars and caterpillar frass will be saved as part of Manomet's long-term ecological monitoring dataset. We'll wrap up with a discussion of how different parts of the food web are connected, and how environmental changes might impact the food web.					
Decomposition Mission	Why should we care about decomposition? Students will learn the answer as they explore the important role of decomposers in an ecosystem and how they contribute to nutrient cycling! Students will participate in a decomposition scavenger hunt and then work together to create a decomposition timeline. Along the way, students will share evidence and ideas, discuss biotic and abiotic factors that contribute to decomposition, and compare their findings to those of their classmates. Student scientists will then use their new expertise to conduct a decomposition survey of fungi, bacteria, and invertebrate decomposition activity on fallen logs, contributing to Manomet's ongoing environmental monitoring work. We'll wrap up with students sharing out their findings and discussing the role of decomposition in nutrient cycles.					

*The banding lab operates in the Spring and Fall. If you are unable to schedule your program during these times, we can provide a link to a pre-recorded visit to the banding lab so students can see banding in action!

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Grades 3-5
Songbird Science and Stewardship Nature Walk
MA STE/NGSS Standards Alignment

Manomet Programs and MA STE/NGSS: Manomet education programs can be used to support student progression toward a wide range of Massachusetts Science and engineering/NGSS performance expectations. Below, we provide a list of relevant Performance Expectations, Science and Engineering Practices, Disciplinary Core Ideas, and Cross-Cutting Concepts covered. All Manomet education programs are customizable; teachers are encouraged to reach out to share their curricular priorities.

Performance Expectations Supported:

3-LS4-3: Construct an argument with evidence that in a particular environment some organisms can survive well, some survive less well, and some cannot survive.

3-LS4-4: Analyze and interpret given data about changes in a habitat and describe how the changes may affect the ability of organisms that live in that habitat to survive and reproduce.

3-LS4-5(MA): Provide evidence to support a claim that the survival of a population is dependent upon reproduction. (optional added focus for spring groups)

4-LS1-1: Construct an argument that animals and plants have internal and external structures that support their survival, growth, behavior, and reproduction.

5-LS2-1: Develop a model to describe the movement of matter among producers, consumers, decomposers, and the air, water, and soil in the environment show that animals can eat plants and/or other organisms for food, and show that some organisms, including fungi and bacteria, break down dead organisms and recycle some materials back to the air and soil. (Stewardship Nature Walk)

5-ESS3-1: Obtain and combine information about ways communities reduce human impact on the Earth's resources and environment by changing an agricultural, industrial, or community practice or process.

		Songbird Science	Stewardship Nature Walk
Science and Engineering Practices	**Developing and Using Models**	Students will manipulate and use model birds to identify the birds and determine their health status. They will also interpret scientific models such as graphs and diagrams to learn more about migration and bird populations and to identify patterns and relationship between variables.	
	Analyzing and Interpreting Data	Students will identify and describe patterns in scientific data about bird populations and use the patterns they have identified to answer scientific questions.	Students will collect quantitative scientific data and share their findings with each other and interpret similarities and differences in their data. We will provide additional resources for teachers including comparison data sets and suggested activities.
	Constructing Explanations	Students will use data they have gathered and their own measurements to make claims regarding the health, migratory status, and adaptations of songbirds.	Students will use data they have gathered and their own measurements to make claims regarding the relationships they are observing between organisms.
	Asking Questions and Defining Problems		Students will use data collected from environmental monitoring sites to hypothesize further investigations and make reasonable predictions of organism interactions and ecosystem changes based on their observations.

		Songbird Science	Stewardship Nature Walk
	Planning and Carrying Out Investigations		Students will take measurements and make observations of abiotic and biotic factors at study sites. These measurements will serve as the basis for evidence of environmental phenomena such as phenology and ecosystem interactions.
	Engaging in Argument from Evidence	Students will share the explanations they have constructed and defend those explanations with reasoning and with scientific evidence from their own measurements and from data they have gathered.	
	Communicating Information	Students will share their findings and ideas with the group, listening actively and comparing findings.	
Cross-Cutting Concepts	**Structure and Function**	Students will use relative scales to describe the weight of their bird models and relate those measurements to bird ecology.	
	Cause and Effect	Students will identify major events in the life of a bird such as migration and discuss how migration can be triggered by season changes. They will also identify and discuss potential causes for population change patterns.	Students will connect their observations of plants and animals to different environmental influences present in the habitat they are studying such as a changing climate.
	Scale, Proportion and Quantity	Students will use relative scales to describe the weight of their bird models and relate those measurements to bird ecology.	Students will measure leaf size, organism abundance, or other environmental factors and describe how and why it may be different from their classmates' findings.
	Patterns	Students will use graphs to identify patterns related to population change over time.	Students will make observations of plant and animal abundance and describe the patterns they are seeing as a group.
	Systems and System Models		Students will observe how different plants and animals work together to create systems.
	Stability and Change	Students will discuss how organisms are affected by seasonal changes and by human impacts on habitat at very local scales. They will also examine trends and relate their findings to environmental change.	
Disciplinary Core Ideas Addressed	**LS1.A:** Organisms have both internal and external macroscopic structures that enable growth, survival, behavior, and reproduction.		
	LS1.C: Food provides animals with the materials and energy they need for body repair, growth, warmth, and motion.		
	LS2.C: When the environment changes, some organisms survive and reproduce, some move to new locations, some new organisms move to the transformed environment, and some die.		
	LS2.A: Plants and animals depend on their surroundings to get what they need.		
	LS4.C: Particular organisms can only survive in particular environments. In any environment, some kinds of organisms, and some individuals of a given species, survive better than others.		
	ESS3.A: Living things need water, air, and resources from the land, and they live in places that have the things they need.		
	ESS3.C: Societal activities can help protect Earth's resources and environments.		