Field Study Experiences

Correlations to the 2016 Massachusetts Science and Technology/Engineering Standards

Explorations: (PreK and K)

This field study allows young children to explore their surroundings, building an awareness of the wide variety of natural phenomena and processes in the world around them. Students might visit Willow Path and walk along Goldsmith Brook, search for pollinators along the edge of a meadow, examine wildlife near the ponds, or explore a woodland area. Using hand lenses and bug boxes, children will see diverse plants and animals. Through songs, movement, hands-on experiences, and conversation, children will investigate and observe the landscape, use language to describe their experiences, create observational drawings to record and share their discoveries with each other.

- PreK-LS1-1(MA) Compare, using descriptions and drawings, the external body parts of animals (including humans) and plants and explain functions of some of the observable body parts.
- PreK-LS1-3(MA) Use their five senses in their exploration and play to gather information.
- PreK-LS2-1 Use evidence from animals and plants to define several characteristics of living things that distinguish them from non-living.
- PreK-LS2-2(MA) Using evidence from the local environment, explain how familiar plants and animals meet their needs where they live.
- PreK-LS2-3(MA) Give examples from the local environment of how animals and plants are dependent on one another to meet their basic needs.
- PreK-LS3-1 (MA) Use observations to explain that young plants and animals are like but not exactly like their parents.
- K-LS1-1 Observe and communicate that animals (including humans) and plants need food, water, and air to survive. Animals get food from plants and other animals. Plants make their own food and need light to live and grow.

Habitats: (Grades 1 and 2)

This field study focuses on two distinct habitats within the Arboretum landscape, giving lower elementary school students the opportunity to discover and closely observe organisms that live in a woodland and organisms live in and around a freshwater pond. In the woodland, students turn over decaying logs to search for soil-dwelling creatures, which they can further examine with magnifiers and bug boxes. At the ponds, each group searches for organisms at the water's edge, and explores the difference between a woodland and an open, cultivated garden. Students also discuss non-living things and how those are different from once-living things. Students use their observations to describe patterns in the natural world and notice how similarities and differences allow for identification and categorization of groups.

- 1-LS1-1 Use evidence to explain that (a) different animals use their body parts and senses in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air, and (b) plants have roots, stems, leaves, flowers,

and fruits that are used to take in water, air, and other nutrients, and produce food for the plant.
- 1-LS1-2 Obtain information to compare ways in which the behavior of different animal parents and their offspring help the offspring survive.
- 1-LS3-1 Use information from observations (first-hand and from media) to identify similarities and differences among individual plants or animals of the same kind.
- 2-LS4-1 Use texts, media, or local environment to observe and compare (a) different kinds of living things in an area, and (b) differences in the kinds of living things living in different types of areas.

Old Plants: (Grades 1-3)

This field study focuses on the parts of trees and other plants, emphasizing the identification of each part and that part's unique function in the plant's growth, survival, and reproduction. Students also begin to notice how individual structures in trees (roots, stems, leaves, flowers, fruits, and seeds) make up a whole tree that works in relationship with the environment as provider of the water, air, and space that the organism needs. Plants also depend on animals for pollination and seed dispersal.

- 1-LS1-1 Use evidence to explain that (a) different animals use their body parts and senses in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air, and (b) plants have roots, stems, leaves, flowers, and fruits that are used to take in water, air, and other nutrients, and produce food for the plant.
- 2-LS2-3(MA) Develop and use models to compare how plants and animals depend on their surroundings and other living things to meet their needs in the places they live.
- 2-LS4-1 Use texts, media, or local environments to observe and compare (a) different kinds of living things in an area, and (b) differences in the kinds of living things living in different types of areas.
- 3-LS-1-1 Use simple graphical representations to show that different types of organisms have unique and diverse life cycles. Describe that all organisms have birth, growth, reproduction, and death in common but there are a variety of ways in which these happen.

Flowers Change: (Grades 3-5)

This field study focuses on the changes that can be observed in flowering plants as an individual flower develops into the seed-holding structure called fruit. Students look carefully for the specific stages of change as a flower begins this gradual, often overlooked, transformation from flower to seed holder. They learn to recognize the location of the male and female reproductive parts of the flower (stamens and pistil) and use these to navigate their way to new understanding.

- 3-LS-1-1 Use simple graphical representations to show that different types of organisms have unique and diverse life cycles. Describe that all organisms have birth, growth, reproduction, and death in common, but there are a variety of ways in which these happen.

- 3-LS4-5(MA) Provide evidence to support a claim that the survival of a population is dependent upon reproduction.
- 4-LS1-1 Construct an argument that animals and plants have internal and external structures that support their survival, growth, behavior, and reproduction.

Plants in Autumn: (Grades 3-5)

This field study focuses on the fall phenomenon of seed dispersal, an important link in the reproductive life cycle of flowering plants. Students are asked to expand upon what they know about a seed (the idea that the job of a seed is to produce a new plant) and to think about the strategies that plants use in dispersing their seeds. They observe the structure of the seed package to look for evidence of this strategy, offering and testing different hypotheses to support their claims. Students collect data and analyze it to determine various modes of seed dispersal, including human interaction with its surroundings.

- 3-LS1-1 Use simple graphical representations to show that different types of organisms have unique and diverse life cycles. Describe that all organisms have birth, growth, reproduction, and death in common, but there are a variety of ways in which these happen.
- 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-LS4-5(MA) Provide evidence to support a claim that the survival of a population is dependent upon reproduction.
- 4-LS1-1 Construct an argument that animals and plants have internal and external structures that support their survival, growth, behavior, and reproduction.

Native Trees and Native Peoples: (Grades 3-5)

This field study focuses on a selection of native New England trees that provided food, shelter, and medicine to the Eastern Woodland Indians. Students learn to look carefully at the characteristics of both evergreen and deciduous trees and use their observations to determine what makes one type of tree different from another. Students travel in small groups using hand-held plant material as clues to help them recognize the trees that the Indians used. After locating each tree, students collect plant material, draw, or make a written record of each tree that captures its unique qualities.

- Social Studies Standard 3.T2 How did Native Peoples live in New England before Europeans arrived?
- 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.
- 4-LS1-1 Construct an argument that animals and plants have internal and external structures that support their survival, growth, behavior, and reproduction.

Hemlock Hill: (Grades 4-6)

The Hemlock Hill forest gives students an opportunity to enter a New England forest to learn about the diversity of organisms that form interdependent relationships within that ecosystem. Organisms can be categorized as producers, consumers, and decomposers, each with observable structures and behaviors that allow for survival. Furthermore, the non-living components of an ecosystem, including air, water, sunlight (temperature), rocks and nutrients in soil, are integral to the health and functioning of any ecosystem. During this field study students obtain and display data to provide evidence that support arguments and model how matter moves throughout the ecosystem.

- 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 to (a) show that plants produce sugars and plant materials, (b) show that animals can eat plants and/or other animals for food, and (c) show that some organisms, including fungi and bacteria, break down dead organisms and recycle some materials back to the air and soil.