Lesson 2: Weaving a Mannahatta Muir Web

Lesson goals:

- Students understand the concept of a Muir web, and how it is different from a food web or chain.
- Students understand the interconnectedness of life on Mannahatta (and in the world generally).

Vocabulary: Muir web, naturalist, native species, habitat

Materials: Set of Muir web cards*
Ball of ribbon
Scotch tape
Mannahatta 1609 image* and/or
Tracing Mannahatta images
Thumbtacks or tape

Teachers weaving a Muir web

New York State Elementary Learning Standards *Key Ideas* and *Performance Indicators*:[1]

- Science *Key Idea* *MST4.LE6:* Plants and animals depend on each other and their physical environment.
- Science *Performance Indicator* *MST4.E.LE6A:* Students describe how plants and animals, including humans, depend upon each other and the nonliving environment.
- Science *Performance Indicator* *MST4.I.LE6A:* Students describe the flow of energy and matter through food chains and food webs.
- Interconnectedness: Common Themes *Key Idea:* *MST6.MO2:* Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.

[Classroom prep: Tack or tape the Mannahatta 1609 image and/or the *Tracing Mannahatta* images to the wall.]

Introduction: Mannahatta review

(5 minutes)

Tell students that today they are going to learn about how life on Mannahatta was interconnected. Ask students to name some of the habitats they remember from Mannahatta 1609. If necessary, prompt them by referring to the images on the wall. If students have done *Lesson 1: Tracing Mannahatta*, ask them to recall the different natural features they traced on the island, referring to the images on the wall.

Activity: Weaving the Muir Web

(20 minutes)

Ask students to stand in a circle with you in the center, and give each student a Muir web card (some cards have a picture of an animal or plant on one side, and its habitat needs on the other side; other cards have pictures of habitats on one side, and a list of species found in that habitat on the other side; other cards depict abiotic needs like sun and water). Explain that these are all species that lived on Manhattan island 400 years ago – they are *native species*. What is a native species? Ask students to study what their species needs to survive. Engage students in a discussion about what a *habitat* is, and about what their own habitat needs are as kids in New York City.

---

[1] From www.nylearns.org/standards. NY State learning standards encompass standards, key ideas, performance indicators and major understandings.

* All images/materials are available on our website, at www.wcs.org/mannahatta.

Tell students that they are going to create their own *Muir web* of Mannahatta. A Muir web is like a food web, but a Muir web includes all the other things plants and animals need to survive beyond just food – it includes all the other different things that make up habitats. A Muir web is named after a man named John Muir. John Muir was a *naturalist*. He talked about how everything in natural systems is interconnected. So a Muir web is a way of showing how everything in an ecosystem is connected to each other. But not everything in a Muir web is alive! Can students see any elements in the circle that are not living things?

Start weaving the web, beginning with any student at random. Give the first student the end of the ball of ribbon, and ask who they are connected to, based on the habitat info on the back of their card. Based on his/her response, connect the ribbon to the next student, and ask who they are connected to. Continue until all students are connected (it's okay if some students get reconnected to the web multiple times, and some are only connected once).

Pull on a few pieces of the ribbon at different points in the web, and ask if students can feel the tug in other parts of the web. Ask why it is that if you pull on the ribbon at one point, students can feel it at another point – even if they aren't directly connected to the ribbon you are pulling. All these plants and animals depend on each other and their habitats and other elements to survive. What would happen if one of the habitats was destroyed – for instance, if the wetlands habitat was destroyed and we cut all the ribbon that led to it – what would that do to the web? Tell students that the web they have created right here is very similar to the webs that existed on Mannahatta, 400 years ago. All of these plants and animals lived on Mannahatta – plus a lot more – and all of these habitats were there too. Ask students to release ribbon but hold onto their cards.

Activity: Where were you on Mannahatta?

(10 minutes)
Give each student a length of ribbon. Ask them to locate where they were on the Mannahatta 1609 image on the wall, then tape their image nearby, and run the length of ribbon connecting their image to the place where they were on the island. If students have done *Lesson 1: Tracing Mannahatta*, ask them to locate their habitats/species using the posted *Tracing Mannahatta* images. After everyone has finished, ask students to take a look at all the species and habitats on the island. Ask students what kinds of habitats exist on Manhattan and in NYC today (both natural and human).

Wrap-up: Connections today and in the future

(10 minutes)
If you were to create a Muir web for Manhattan today, what are some of the elements you would include? If you could help decide how Manhattan will be different in the future, what would you include in the city's Muir web for the future?

Extension activities:

- Students make a wall image with Mannahatta at the center, and all the Muir web cards surrounding it. In addition to showing where the different things shown on the cards would have been on Mannahatta, also connect the cards to each other with ribbon, so that students can see the rich networks among them all.
- Students create personal Muir webs of their lives. What are all the elements they need in order to live? What do those elements need to live, in turn? In addition to creating webs as diagrams, students can write about the ways they are connected to others. This could also be conceived of as a Muir web of the school ecosystem.