

## B: Birds Eye View

### Introductory Lesson: What is Ecology?

In order to understand the complex story of water in Shelburne and that of our watershed at large, students must first understand the interconnectedness that is inherent in all ecosystems. In order to do that we will start with a discussion about ecology and then review the road map for the unit. This will allow students a chance to weigh in, discuss what they already know, and what they are curious to learn.

### Formative Lessons

#### Activity 2: What are the characteristics of Living Things?

Students will identify and describe the characteristics that all living things share. Students will distinguish between living (biotic) and Nonliving (abiotic) things and separate organisms into even smaller subcategories.

#### Activity 3 -Components of an Ecosystem, Abiotic and Biotic Factors

Students will learn to distinguish between the biotic and abiotic factors in an ecosystem, and will begin to theorize what happens when a component in an ecosystem goes missing. They will "remove" factors from their own personal ecosystems and reflect on how that would undoubtedly alter their experience.

#### Activity 4: Sources and Sinks

Using maps students will identify and draw the important features in Shelburne that help tell the story of our local sub-watershed.

Activity 5: Water Filtration Problem Solving

#### Activity 5 -Biological Communities

Students will distinguish between an ecosystem and a community. They will collect, examine and identify as many organisms from a local soil community, and water community. They will analyze their data and determine what it tells them about the health of the community.

#### Activity 6 -Ecosystem Jenga

This hands-on activity will serve as a model for a real-world ecosystem and the delicate balance that exists in maintaining equilibrium.

#### Activity 7: Laplatte River Observation

Students will create an event map of their observation while paying attention to whether human activity either deliberately or inadvertently affects the ecosystem here.

#### Activity 8: Cycles of Matter/Biogeochemical Cycling

Students will review the concept of matter cycling and review the major biogeochemical cycles.

#### Activity 10: What is the story of the Lake Champlain Basin Watershed?

Students will partake in a watershed reading jigsaw, and begin to think about where our most important resource comes from.

#### Activity 11: Water Filtration Problem Solving

Students will work in problem solving groups to construct a water filtration system that will clean their sample of water. They will have limited materials and limited money. The emphasis is on design engineering and the opportunity to re-design.

#### Activities 12: Constructed Filtration Systems- Wastewater Treatment Plant Visit

Students will visit our local Waste water plant, and explore and learn about constructed filtration systems.

**Activity 13: Natural Filtration Systems/Introduction to the Wetlands**

Students will visit local examples of wetlands and learn about the function and value of a wetland. They will compare and contrast the experience to that of the constructed filtration systems. Students will also learn about sources and sinks of phosphorous in the lake.

**Activity 14: What is the current state of the Lake?**

What do larger studies reveal about the phosphorous content in the lake? How does this compare with our observations locally?

**Activity 15: What is the story of our local Sub-watershed?**

Students will begin to pull together all of their observations about Shelburne and begin crafting the story of water through and around Shelburne. Students will work towards the goal of sharing these presentations with a larger audience, namely the fourth and fifth grade classrooms here at SCS.

**Activity 16: The Great Debate**

Students will read about several ecological issues currently facing Lake Champlain, watch several videos and will gather evidence for and against the issue and will then practice debating orally prior to crafting their written pieces.

**Activity 16: State your Claim**

Students will craft an argument piece on one of the ecological issues they have previously debated.

**Culminating Activities**

Student final products will have two parts: The first will be the creation of an EDpuzzle presentation that answers the essential question: How do the abiotic and biotic factors contribute to the story of water in our local sub-watershed? It will be shared with the an authentic audience the fourth and fifth grade students here at SCS.

- How do the abiotic and biotic factors contribute to the story of water in our local sub-watershed?
- **Story of Water Rubric**

The second component involves writing an argument piece about one of the topics below:

- Whether or not bottled water should be an available resource.
- Whether or not the use of microbeads in personal care products should be banned in VT.
- Whether or not there should be a pollution tax on carbon emissions for businesses here in VT.