

## **“SITES OF ENGAGEMENT” LESSON PLAN**

**What is the CONTEXT of this learning experience?  
Include the ESSENTIAL QUESTION/if applicable.**

This is the site based lesson for my unit on invasive species in the Memphremagog watershed. Prior to this lesson, students have: investigated the current quality of the Memphremagog watershed, analyzed the biotic/abiotic factors involved in the watershed, , investigated and defined what invasive species are, established which invasive species *could* be present in the watershed, learned *how* one goes about sampling for invasive plants, and built the tools for the sampling.

**ESSENTIAL QUESTION: How do we survey for, collect, and identify plant and animal samples in the field?**

**WHERE will this “engagement” take place?**

This lesson will occur at a local water body that will be pre-selected by me. The site will be at a local lake where there are many plants around a shallow shoreline, and a relatively easy access. The lake is one that is frequented by members of our community; so many students may have had experiences or prior connections to this water body.

**What is the PLAN for your students?**

Pre-visit: The lesson before this, students will build/create sampling rakes to use for testing, as well as collect any additional materials to be brought to the site (field guides, maps, collecting jars/bags, ID keys). Students will also practice using the tools, as well as preparing a fictional sample to be sent in to an agency for analysis.

On-Site: Once students arrive at the site, they will divide into their lab groups. Each team will be given a specific site to sample. Students will use collecting rakes to test for samples. As one student "throws the rake", others will be observing and writing observations about the environment we are sampling (they will list biotic/abiotic factors, species they see, weather conditions, basic water conditions, and additional observations.) As students sample, they will identify what they are collecting. If the students find a plant that is of questionable nature they will package it, as practiced in class, to return with us and be further studies. Students will record the species of plants they identify, as well as how many samples they collect.

In addition to data collection and surveying, I will use the field visit to assess a couple skills/concepts gained/practiced in class. **1)** I will pre-select 3 species at the site that students must identify using a provided field guide or dichotomous key. This will assess their ability to use the key as practiced. **2)** I will choose a "sit-spot" for the students to gather at. While listening silently, I will have students' list 3 biotic factors and 3

abiotic factors that they can identify from that spot. This will assess their knowledge of these terms in a real world setting.

This may extend into a two day field visit. The more I look at it I feel like I will use two days. First day could be strictly for sampling and collection, while the second day could be additional sampling and then the sit-spot and key testing. Also, a two day experience hopefully minimizes absence issues and the missing out of the visit.

Post-visit: Students will return to classroom and store any collected samples. Next class, students will begin to analyze collected samples, data, and organize the data into a more accessible manner: i.e. graphs, data tables, class averages. This data will be used in the construction of the students' final product, and in the post-lab analysis questions.

**What is the OUTCOME of this experience?**

- After this experience is completed the students will have a few take away (I hope).
- First off, the students will have an immediate, albeit surface level, answer to our question if there are invasives at our site. They will have data that will help to explain the ecosystem and potential happenings of our site. This will be the majority of the students "Data" section in their lab report.
- In addition to this data, the students will have gained a number of skills, and applied them in a field setting. Sampling/surveying, identification of species and critical analysis skills will all be gained/developed throughout the unit, but this experience is where it all comes together.
- "The Bigger Picture" piece is one that I think some students may be beginning to put together by this point in the unit. As they analyzed the biotic/abiotic factors, the complexity of food webs, and then see these pieces in the field, students may begin to grasp the how many influences an ecosystem has, and how fragile they can be. They will start to see it class #2 of the unit, when we discuss WQI and the 9 major factors that are used to calculate it. By the time they reach the lab report and critical analysis questions, I hope students have started to absorb this concept.

**What resources/preparation are needed for you to be ready for this experience?  
In what ways does this plan incorporate other district/grade-level expectations?**

The resources that need to be prepared (many have been prepared already) are as listed:

- Sampling materials (rakes, collection bags, sampling buckets)
- Field guides/golden guides of pond life, marine life, macroinvertebrates, fish, amphibians, reptiles, birds, mammals, and weather/climate.
- ID keys
- Information recording sheet for identification of species/characteristics
- First aid kits
- Disposal bottles
- Trash bags for any waste