

LESSON 1

Title: DEI Tour

Subjects:

- Career and Educational Development, Science, Health and Physical Education, History, ELA, Math, Social Studies

Grade level(s): Grades Pre-k through 12+

Standard(s):

Maine Learning Results

- Career and Educational Development. Interpersonal Skills (A3.pre-k to diploma.a,c)
- ELA. Informational texts (A3.3.c); (A3.3.e); (A3.6.e); A3.9-diploma.b); Research (C1.3-5.a,c,d)(C1.6-8.g); (C1.9-diploma.a,c); Listening (E1.3-diploma.c); (E1. 9-diploma.a); Speaking (E2.3-8.d); (E2. 9-diploma.a)
- Health and Physical Education. Cooperative Skills (I1.pre-k to diploma.a-d); Responsible Behavior (I2.pre-k to diploma)
- Math. Data (B1.4-8.a,b); (B1.9-diploma); Measurement and Approximation (B1.4-diploma.a,b); (B1.9-diploma.a,b,c); (B2.3-6); (B2.7.1a, 1b); (B2.8-diploma.3)
- Science. Scientific Inquiry and Technological Design (B1.3-diploma.a); (B1.3-diploma.b); (B1.3-diploma.c); (B1.3-diploma.d); (C1.3-diploma.a)
- Social Studies. Taking Action Using Social Studies Knowledge and skills (A3.3-diploma)

Common Core:

- ELA. (V.3-12.6); (SL.3-12.1c); (SL.3-5.1); (L.3.5b);(L.3.5b)
- Science and Technology. (R.6-12.4); (R.7-12.4)

STEM Skills

Brief Description: This lesson involves a tour of the DEI facility at Beals, Maine. The students will learn about DEI's history and current projects, observe some live

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marine species in saltwater tanks, and view some larval stages of marine species, including clams, under the microscope. If the students are involved in the clam project, which involves studying the growth and survival of juvenile hatchery clams placed in a local clam flat for several months, a Power Point presentation of that project will be a part of the tour.

Adaptations for different age levels: Students in middle grades and above may complete the worksheets that accompany Lesson 1 individually, in groups, or with a partner. The Instructor could project the website using a Smart Board or similar piece of equipment or use several computers with students sitting in small groups around them, depending on the group's size. As the instructor reads the website information, and the group looks at the site together, the students would be learning about DEI and its marine science projects and capabilities. The class could move through the information as a group.

This is an excellent lesson to use to “pair up” some upper grade students who have more computer skills with the middle grade students who are just learning the skills.

The students could do a group “Umbrella Chart”(in the materials for Lesson 4) after they get back to the classroom. The center circle could be titled “At DEI, I learned that.”

Younger students could view the web site to give them an idea of what they will see prior to their trip or they could view the website after the trip to review what they saw.

Students in the Pre-k to Grade 3 group may benefit from having the Instructor preview the website and accompanying worksheet and present the material to the students as they watch the website, omitting sections that might be too difficult for them or at least explaining the information in a manner that they can understand. The Instructor would need to adjust the time to be spent on certain sections to the attention abilities of the students.

Objectives/Goals: After completing this lesson, the students will be able to:

- Demonstrate an understanding of what DEI is and what it does;
- Describe aspects of the hatchery process used to raise *Mya arenaria*.

Time needed: About a half hour

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Keywords: The students will not be doing vocabulary work, but they may hear some of the vocabulary when they tour DEI.

Materials Needed:

Computers with Internet capability

Worksheet of the Web Introduction to DEI for each student

Worksheet for “My Research Notes about _____” or “Umbrella Chart”

Procedure:

Pre-Tour Activity: To give the students some background about DEI prior to their visit have them do a Web review of DEI’s facility using the provided worksheet, their computers and the site <http://www.downeastinstitute.org/>

(Prior to using the provided Web search worksheet, the instructor should review it to make sure the information is up to date, as the site is updated periodically.)

Note: The Instructor could assign the Abstracts for question 19 of the worksheet for older students, so that all areas of published research could be covered in a later class discussion. This assignment could be a separate Lesson 19.

Introduction: The Director of DEI gives a brief history and tour of DEI. If the students will be part of a clam project, the Power Point presentation will provide information at a later point in the tour. Career Development Opportunities are mentioned in this portion of the tour.

Key Questions (see worksheet)

Main Activity The students are taken in steps through the entire operation of raising clams from spawning through juvenile stages. They get to see how the algae is grown from small beakers in the algae starting room until it fills algae tanks that line the walls of another room. They will see the larval tanks, settling tanks, summer screen “houses,” and winter “cages.” They receive information about the sanitation conditions required in the lab area, which they are allowed to view. All other areas of the facility are open to them, and as they see the holding tanks, they receive information on the process. Whatever is happening at DEI is what the students see

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on that day. The hatchery is fully operational, so if there is a job in progress for that time period, the students get to see that happen.

After the students go on the tour, they go into the lab/classroom at DEI. They get the opportunity to view some saltwater aquariums with various species of marine life such as clams, crabs, juvenile lobsters, oysters, sea stars, urchins, and sea cucumbers. They are also given the opportunity to use microscopes to see various larval stages of clams and oysters, or lobsters as available depending on the hatchery projects.

If the school is in the Clam Project, the students will view a Power Point presentation of the project to learn about the important research data that can be gained from a project.

Conclusion : The students will have an opportunity to ask questions throughout the presentation and at its end. If time is available, the director may do the “Cast a Clam to the Wind” activity (Lesson 8) with the students and have them try throwing clamshells into the ocean.

Assessment:

As a follow-up activity the students could do one or more of the activities listed below:

1. Using our web site questionnaire, send students to the DEI home website to review/learn more about what DEI does for the community.
2. Facilitate a class discussion about the importance of preserving a natural resource that is beneficial to the communities that depend on it.
3. A computer search of other “hatcheries” worldwide would illustrate to students the importance of this concept of preserving a natural resource. The students could share their findings with the class.
4. Younger students could do the Umbrella chart review.