New England Aquarium
Educational Field Trip Activity Series

Exhibit Expert:
New England Waters

Learning Level
Intermediate-Advanced

Subject Areas
Science, Literacy

Preparation
- Preview Aquarium field trip orientation video
- Practice activity with pictures, posters or videos of marine life (optional)
- Review vocabulary appropriate for your students
- Divide students up into field trip groups prior to visit so they know who the members of their will be

Duration of Lesson
- Before your visit: One to two class periods
- During your visit: 10 to 20 minutes
- After your visit: 10 to 20 minutes

Lesson Standards
Common Core (ELA)
- Reading Standards: Foundational Skills
- Writing Standards
- Speaking and Listening Standards
- Language Standards

MA Science Standards
- LS. Characteristics of Living Things
- LS. Living Things in their Environment

Objectives
Students will become experts on an ecosystem in New England waters. They then have a chance to teach their fellow students about that ecosystem.

Students will be able to:
- Carefully observe animals and their surroundings
- Identify animals that live in the Northern Waters Gallery
- Clearly describe their observations in written form
- Work with others to synthesize notes and memories into a teachable format

Skills
Observation, communication, literacy, group work

Vocabulary
Community, ecosystem, fish, fresh water, invertebrate, New England, observation, reptile, salt water, shorebird, temperature

Materials
Classroom Lesson Materials: Aquarium field trip preparation video (www.neaq.org/preview), journals (attached), pencils, large pieces of paper (5-6 per class), markers and/or crayons, New England Aquarium exhibit photos (attached), reference books available from the Teacher Resource Center (www.neaq.org/teachers).

Field Trip Lesson Materials: Journals (attached—print on card stock) or clipboards (if student sheets are not on card stock). Please do not allow students to use the Aquarium glass as a writing surface, as pencils and pens can damage the acrylic.

Procedure
Before your visit:
Show students and chaperones the Aquarium field trip orientation video. Discuss expectations around the field trip and introduce the activity the students will be responsible for during their visit. You can also download the Field Trip Planning Guide from www.neaq.org/fieldtrips.

Divide students up into their field trip teams (minimum of three) so they know who will be in their group prior to leaving for the trip. Give the students enough time to ask questions and practice using the student sheets in class.

Introduce the Exhibit Expert activity (10 minutes):
- Have students turn to pages 1 and 2, the Exhibit Expert practice pages of their journal.
- Hand out New England Aquarium Exhibit Photos (attached).
- Instruct students to work in groups to answer the questions on pages 1 and 2 in their journal.
During your visit:

NOTE: Plan for no more than 5 to 10 students at one exhibit at one time. Instruct students to answer the questions on pages 3 to 6 in their journal. If time allows, direct them to do the extension activity (attached).

This activity should only last about 20 minutes when you are at the Aquarium. We do not recommend that students spend a large part of their visit doing an activity. We encourage them to explore and discover other parts of the Aquarium after or before their activity.

Break students up into three groups to observe the following tanks on Level 3 in the Northern Waters: Gulf of Maine exhibit area.

• Shorebirds—Group 1

• Boulder Reef Exhibit—Group 2

• Sandy Bottom Community—Group 3

After your visit:

Divide students into groups according to which exhibit they focused on during their visit. Within each group, challenge students to make a poster about their chosen habitat. They should use their own notes and observations to develop their posters. The New England Aquarium’s Teacher Resource Center can also provide books and other resources to help your students with their research project.
Each group will present their habitat. It may help to have each student pick one interesting fact that they want to share with the class.

Student journals are attached at the end.

Post-Trip Assessment
You can use a rubric like the one below, designed for free at rubistar.4teachers.org, to help score your students’ work.

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of Class Time</td>
<td>Used time well during each class period. Focused on getting the project done. Never distracted others.</td>
<td>Used time well during each class period. Usually focused on getting the project done and never distracted others.</td>
<td>Used some of the time well during each class period. There was some focus on getting the project done but occasionally distracted others.</td>
<td>Did not use class time to focus on the project OR often distracted others.</td>
</tr>
<tr>
<td>Title</td>
<td>Title is descriptive, informative, can be read from 6 feet away and is quite creative.</td>
<td>Title can be read from 6 feet away and describes content well.</td>
<td>Title can be read from 4 feet away and describes the content well.</td>
<td>The title is too small and/or does not describe the content of the poster well.</td>
</tr>
<tr>
<td>Attractiveness</td>
<td>The poster is exceptionally attractive in terms of design, layout and neatness.</td>
<td>The poster is attractive in terms of design, layout and neatness.</td>
<td>The poster is acceptably attractive, though it may be a bit messy.</td>
<td>The poster is distractingly messy or very poorly designed. It is not attractive.</td>
</tr>
<tr>
<td>Knowledge Gained</td>
<td>Student can accurately answer all questions related to facts in the poster and processes used to create the poster.</td>
<td>Student can accurately answer most questions related to facts in the poster and processes used to create the poster.</td>
<td>Student can accurately answer about 75% of questions related to facts in the poster and processes used to create the poster.</td>
<td>Student appears to have insufficient knowledge about the facts or processes used in the poster.</td>
</tr>
<tr>
<td>Labels</td>
<td>All items of importance on the poster are clearly labeled with labels that can be read from at least 3 feet away.</td>
<td>Almost all items of importance on the poster are clearly labeled with labels that can be read from at least 3 feet away.</td>
<td>Several items of importance on the poster are clearly labeled with labels that can be read from at least 3 feet away.</td>
<td>Labels are too small to view OR no important items were labeled.</td>
</tr>
<tr>
<td>Content Accuracy</td>
<td>At least 7 accurate facts are displayed on the poster.</td>
<td>5 to 6 accurate facts are displayed on the poster.</td>
<td>3 to 4 accurate facts are displayed on the poster.</td>
<td>Fewer than 3 accurate facts are displayed on the poster.</td>
</tr>
<tr>
<td>Required Elements</td>
<td>The poster includes all required elements as well as additional information.</td>
<td>All required elements are included on the poster.</td>
<td>All but 1 of the required elements are included on the poster.</td>
<td>Several required elements were missing.</td>
</tr>
</tbody>
</table>
Community
A collection of two or more populations of more than one species in a given area that interact

Ecosystem
A set or network of living (biotic) and nonliving (abiotic) factors in a given area that can be as small as a drop of water and as large as the ocean

Fish
An animal that lives in the water that uses gills to breathe, fins to swim and has scales covering its body

Fresh water
Refers to natural bodies of water that do not contain high amounts of salt, such as rivers, lakes and ponds

Habitat
The environment in which an organism is commonly found that provides it with food, shelter and water

Invertebrate
An animal that does not have a spine/backbone (e.g. worms, anemones, sea stars)

New England
The Northeast region of the United States that includes the states of Connecticut, Rhode Island, Maine, Massachusetts, New Hampshire and Vermont

Observation
Detailed exploration and description using the senses

Population
A group of the same species living in the same area

Reptile
Cold blooded, generally egg-laying animal such as a turtle, snake or lizard

Salt water
Ocean water (3% salt), water that contains salt

Shorebird
Birds such as plovers, gulls and sandpipers that do not travel far from the coast and are often found on the beach

Temperature
Measurement of the hotness or coldness using a thermometer (determined by the vibration of molecules: more vibration=more heat)
1. **Mouths**
   Do you notice different mouth types? What do you think the different mouth types might be for?

<table>
<thead>
<tr>
<th>Draw or describe the type of mouth</th>
<th>Why is it shaped that way?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tbody>
</table>

Why do animals have mouths of different shapes?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
2. **Camouflage**
   What animals are camouflaged? How are they camouflaged? Do you think they change color or were they born that way?

<table>
<thead>
<tr>
<th>Name of animal that has camouflage</th>
<th>Describe or draw the camouflage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

3. **Fins**
   What kinds of fin shapes do different fish have? Why do you think they might have different shapes? What shape would you choose if you were going to be a fish?

<table>
<thead>
<tr>
<th>Draw the fin shape</th>
<th>Name of animal</th>
<th>Why does it have that shape?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. **Superlatives**

<table>
<thead>
<tr>
<th>My favorite animal</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The prettiest animal</td>
<td></td>
</tr>
<tr>
<td>The strangest animal</td>
<td></td>
</tr>
<tr>
<td>The funniest animal</td>
<td></td>
</tr>
</tbody>
</table>
To print the following journal pages, set your printing preference to print:

- Double Sided
- Binding Side on the TOP/short edge
What animals or exhibits do you want to make sure you see? Write them here.
Look at a picture of a New England Aquarium exhibit to answer the following questions BEFORE your field trip.

1a. What part of the world does this exhibit show? (Please circle)
   - Atlantic Ocean
   - Pacific Ocean
   - Amazon River
   - Caribbean Sea

1b. Water type:              Fresh  Salt

1c. Water Temperature:      Warm  Cool

2. Describe the largest animal you can see in this picture.


3. Describe the smallest animal you can see in this picture.


4. Describe your favorite thing about this picture.


5. What **kind(s) of animals** are in this picture? (Please circle)

- Invertebrates
- Fish
- Birds
- Reptiles

Anything else? What?____________________________

6. What is in this picture that is **not an animal**? (Please circle)

- Rocks
- Sand
- Plants
- Water

Anything else? What?____________________________
Look at the exhibit panels and inside the tanks at the New England Aquarium to answer the following questions **DURING** your field trip. (Circle one)

1. What is the **name** of this exhibit?
   - Shorebirds
   - Boulder Reef
   - Sandy Bottom Community

2. What is the **bottom** of this exhibit covered in?
   - Sand
   - Rocks
   - A mix

3. How **deep** is this exhibit? (Can you see dry land?)
   - On the coast
   - In deep water

4. Describe the **largest animal** you can see in this exhibit.

   ___________________________________________________
   ___________________________________________________
   ___________________________________________________
   ___________________________________________________

5. Describe the **smallest animal** you can see in this exhibit.

   ___________________________________________________
   ___________________________________________________
   ___________________________________________________
   ___________________________________________________
6. Describe your favorite thing about this tank.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

7. What kind(s) of animals are in this exhibit? (Please circle)

- Invertebrates
- Fish
- Birds
- Reptiles

Anything else? What?____________________________________________________

8. What is in this exhibit that is not an animal? (Please circle)

- Rocks
- Sand
- Plants
- Water

Anything else? What?____________________________________________________
In the space below draw parts of the exhibit. Label as much as possible. Describe what the animals are doing.
Flooded Forest Exhibit
Pacific Northwest Exhibit
Pacific Reef Community
The Trust Family Foundation Shark and Ray Touch Tank