Lesson: Water's Living Things: Indian Creek Exploration

Environmental Literacy Question: How have humans affected the Chesapeake Bay and its watershed?

Topic/Essential Question: What characteristics of an organism help it survive in their habitat, and how has human activity changed their habitat and ability to survive?

Unit/Lesson Sequence: One of two lessons in the "Water's Living Things" 4th grade module based at Arlington Echo Outdoor Education Center.

Content Standards:

- **Environmental Literacy:**
  5.A.1. Analyze the effects on human activities on earth's natural processes.
  8.F.1.b. Identify actions that can be taken as individuals and those that require the involvement of other people, organizations and government.
- **Science:**
  6.4.B.1. Recognize and describe that people in Maryland depend on, change, and are affected by the environment.
- **Common Core Standards for English Language Arts Standards-**
  Speaking and Listening-4th Grade
  Comprehension and Collaboration
  - CCSS.ELA-Literacy.SL.4.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.

Length of Lesson: 35 minutes

Student Outcome: The students will identify different organisms found in a series of habitats and identify why they have adapted to live in those places. Students will also search on the water for those different organisms via canoe.

Knowledge of the Learner:

- Prerequisite knowledge, skills, and processes: Basic understanding of erosion as a natural process and erosion made worse by human development. Basic understanding of what makes a good habitat for aquatic life.
- Student needs, interests, previous learning: These will be determined during the pre-assessment.
- Conceptual difficulties: Learning to navigate the canoe specifically that the boat moves opposite of the paddling motion.
- Differentiated: This lesson will appeal to different types of learners. Kinesthetic learners should do well with the physical act of navigating the canoe. Interpersonal learners will benefit from the team dynamic required for steering a canoe. Observing the different shoreline types and making assessments should appeal to visual learners.

Knowledge of Content:

- **Vocabulary:**
  Habitat Erosion Bulkhead
  Rock Riprap Living Shoreline
- **Resources:**
  Life jacket for each child and adult
  Life Ring
  "Can You Find…?" poster
  Paddle for each child and adult
  Emergency blankets
  Canoes
  Waterfront Radio
- **Supplements**
  Supplement A: Canoeing Skills
  Supplement B: Background Information
  Supplement C: Discussion Points and Questions

Lesson setup:

Go to the waterfront and pull down the number of canoes needed for the group (one canoe for each student pair and two for activity leaders). Secure the canoes by clipping them to the floating dock. Set up the poster and put out the life ring and emergency blankets from the pier closet.

Instructional Delivery

Module Introduction: All students and activity leaders will meet behind the Dining Hall. An Arlington Echo staff member will talk about PFDs (personal floatation devices; life jackets) and hand them out to students and chaperones. Each student must keep their PFD on for the duration of the activities unless otherwise instructed. In addition, staff will discuss with students ways to behave safely down at the waterfront (no running, wearing a PFD, paying attention to instructions, leaving small rocks on the ground).

Pre-Assessment:

1. Welcome the students to the activity and introduce yourself.
2. Ask students if anyone has been on a boat before. What kind of boat (motorboat, canoe, rowboat, kayak)? Do any of them have boats at home?
3. Ask students how do human activities affect the Indian Creek habitat?

Motivation/Warm-up:

1. Engage the students by explaining that they will be going on a scavenger hunt while canoeing. Tell them they will be exploring Indian Creek at Arlington Echo by canoe and searching for organisms found in that particular habitat.

2. Ask students what kinds of animals and plants they think they might see. Hand each student a card and ask them to place it on the appropriate spot on the poster. Discuss why an animal might live in the appropriate habitat and what adaptations they have to survive.

Procedure

1. Go over canoeing skills. Each student should select a paddle appropriate for their height (when standing with the blade of the paddle on your toes, the grip should fall between your nose and chin. Red paddles will work for most students; blue for taller students). Once they have a paddle, they should hold it with the blade resting on their toes, not on the ground).
2. Have students pair up and stand in two rows as if they are in imaginary canoes. The more experienced paddler should be in the back. Where skill is equal, the larger person should take the back seat. The person in the back seat is the "Captain" and is in charge of communicating since they can see what the person in front of them is doing.
3. Demonstrate basic canoeing maneuvers: forward stroke, back stroke, canoeing in a straight line, and turning a canoe. Have the pairs of students follow along with their paddles, making sure that students are paddling in the air, not scraping the ground *(one activity leader could demonstrate these techniques in the water while the other discusses and mimics them on land by the students).*
4. Demonstrate the proper technique of boarding a canoe. Be sure to emphasize the importance of staying low and keeping three points of contact ***(See Supplement A).*** NEVER stand in a canoe.
5. Point out the boundaries for canoeing. Students can go back into the Indian Creek (to the right), but are not to canoe past the yellow buoys into the Severn River, or past the dock to the left.
6. A canoe with at least one adult in it should be the first to go out. The other activity leaders/chaperones will stay behind to assist students in boarding their canoes and keep a lookout from the shore. **We HIGHLY recommend that you leave all personal electronic devices on shore, just in case!**
7. Guide the students into the cove, where they can look for various wildlife and physical features of the area. Be sure they try to locate one example of each of the three shoreline types (wooden bulkhead, rock riprap, and living shoreline).
8. You may have to direct or tow students whose canoes get stuck. If the creek is too shallow, tell students to not canoe past the seining pier (or some other boundary). Make sure students look out for any students that are seining in Indian Creek.

Assessment:

1. Upon returning to shore, ask the students to tell you what they found during their exploration. After they've pointed out a few things, guide them towards discussing the human impact on the Indian Creek habitat. **(See Supplements B and C)**

Notes for Clean up

Please organize and return the lesson folder, poster and life ring to the boat pier shed. Please also rack any canoes that were used during the lesson. Remember to inform the Arlington Echo Staff if you need assistance or if any materials are damaged or missing.

Notes for morning set up (overnight trips):

Remember to set up your materials and pull canoes off of the rack prior to the morning activities. If you do not spend the night, please check in with the AE staff assigned to the module and be at your teaching location by 8:30 a.m.

Notes for Inclement Weather:
Arlington Echo encourages keeping our outdoor activities outdoors —even in the rain—but in the case of severe weather (thunder, severe cold, etc.), the rain location for this activity will be determined when your schools arrives (Resource Lab or Dining Hall).

Supplement A:

Canoeing Skills

Choosing the right paddle and PFD

1. Paddle: Place the blade of the paddle on top of your toes while standing. The grip should fall between your chin and nose.
2. PFDs: All Type II PFDs are sized according to the weight of the wearer. Pass out the PFD that corresponds to the students weight.

Entering a Canoe

1. The activity leader should sit on the dock with both feet in the canoe, holding the canoe steady.
2. The student should sit on the dock with feet in the canoe in front of the seat they will be using, as show in picture one.
3. The student holds the opposite side as shown in picture #2
4. The student slides into the seat, remaining low.
5. Load the second canoer in the same manner.
6. When loading the canoe, the person sitting in the back of the canoe gets in **first**, to keep the canoe stable.

Picture 1

Picture 2

Leaving a Canoe

1. The activity leader should sit on the dock with both feet in the canoe, holding the canoe, the same as when students are entering.
2. The student should place their paddle on the dock.
3. The student should slide sideways out of the seat, staying low, and sit on the dock.
4. The student can then carefully swing their legs out of the canoe and stand on the dock. Make sure that students are NOT standing in the canoe!
5. When unloading the canoe, the person in the back of the canoe gets out **last**, to help keep the canoe stable.

Holding the Paddle Properly

1. If paddling on the right side of the canoe, hold the grip with your left hand with fingers facing away from the body (Tell the students to "high five" their paddles to place their hands in the proper position.). Hold the shaft wherever your right hand falls comfortably, fingers facing down.
2. If paddling on the left side, reverse this so that the right hand is on the grip and the left hand is on the shaft. The shaft of the paddle should always go across the front of your body.

Forward Stroke

1. If paddling on the right side of the canoe, extend the right arm forward and dip the blade straight into the water. Make sure paddle is perpendicular to the canoe.
2. Pull the blade straight back towards you, pushing the water backwards and propelling the canoe forwards.
3. Stroke ends when the top arm is fully extended.
4. Turn the paddle sideways, lift it from the water, and return to the starting position.
5. Note that doing this stroke on the right side of the canoe will make the boat veer left; paddling on the left will make the canoe veer right. For example, in a canoe of two students, if both students paddle on the right side of the canoe will go LEFT; if both paddle on the left the canoe will go RIGHT; if the paddle on opposite sides the canoe will go STRAIGHT.

Backstroke

1. If paddling on the right side of the canoe, bend the right arm backward and dip the blade into the water behind you, flat to the surface.
2. Extend you right arm and move the blade forward through the water, pushing the water away and propelling the canoe backwards.
3. The stroke ends when your lower arm has fully extended.
4. Turn the paddle sideways, lift it from the water, and return to the starting position.
5. Note that doing this stroke on the right side of the canoe will make the boat veer right; paddling on the left will make the canoe veer left.

Away Stroke (optional)

1. Paddle enters the water directly alongside the boat. Blade of the paddle should be parallel to the canoe.
2. Push the paddle through the water straight out away from the canoe.
3. Canoe will move sideways, away from where you're pushing. For example, if you push away on the right rear of the canoe, the rear of the canoe will turn left while the front turns right. If you push away on the right front of the canoe, the front of the canoe will turn left will the rear turns right.

Draw stroke (optional)

1. Paddle enters the water directly to the side of the paddler, out away from the canoe. Blade of the paddle should be parallel to the canoe.

2. Pull the paddle through the water straight towards the canoe, drawing water towards the boat.
3. The canoe will move sideways, towards where you're drawing. For example, if you draw on the right rear of the canoe, the rear of the canoe will turn right while the front turns left. If you draw on the front right of the canoe, the front of the canoe will turn right while the rear turns left.

Supplement B

Animal Adaptations

Discussion Points and Questions

Motivation/Warm-up – Poster Discussion

Point/Question	Discussion/Answer
Water	Gills to breathe under water- fish, crabs, shrimp Camouflage to hide from predators- Fish Fins to swim- fish Grow in a wet environment/provide food, shelter, oxygen for animals- SAV's Poster Animals-Rock Fish, Blue Crab, Grass Shrimp, SAV's
Land	Fur for warmth only on land-mammals-Deer Hatch or birth on land/not water dependent-birds, snakes, bears, deer Feathers that are not meant for swimming-Some birds Run fast to escape predators-deer Hide up high in trees-Birds Poster Animals- Deer, Bears, Cardinal, Black Snake
Wetland	These animals and plants have special skills that adapt them to both life on water and land. Muskrats- Use wetland grasses to hide and raise young Redwing Black Bird- Hides in grasses, gets food from grasses. Osprey-Eat fish or crabs from the waterways Poster Animals- Muskrat, Osprey, River Otter, Duck

Assessment
Ask students a series of questions:

- **What type of animals/plants did you see on your canoe scavenger hunt? (students will list)**
- **What are some of the adaptations of animals we previously talked about (see above chart)**