

Lesson: Severn Science- Indian Creek Exploration

*Arlington Echo works to continuously improve our lessons. This lesson may be modified over the course of the school year.



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

Topic/Essential Question: “How is the earth’s climate changing?”

Unit/Lesson Sequence: This is one of two lessons in the “Water” 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: Students will learn that Maryland’s landscape is changing due to man-made and biological changes. Students will identify different shorelines found along the Severn River and in the Chesapeake Bay region to identify which are man-made and which are natural. They will be able to discuss climate change and its impact on Maryland. Students will also search on the water for various organisms found in the Severn River and Indian Creek via canoe.

Knowledge of the Learner:

- Prerequisite knowledge, skills, and processes: Basic understanding of how Man changes land to meet his needs without considering the impact these changes can have on other organisms.
- Student needs, interests, previous learning: These will be determined during pre-assessment.
- Conceptual difficulties: Learning to navigate the canoe: specifically that the boat moves opposite of the paddling motion.
- Differentiated: This lesson appeals to different types of learners. Kinesthetic learners respond to the physical act of navigating the canoe. Interpersonal learners benefit from the team dynamic required for steering a canoe. Observing different shoreline types and making assessments should appeal to visual learners.

Knowledge of Content:

• **Vocabulary:**

Types of Shorelines:		Trends:
Natural shoreline	Rock Riprap	Rise in sea levels
Wooden Bulkhead	Living Shoreline (man-made)	Subsidence (land sinking) Maryland

• **Resources:**

- | | |
|--------------------------------------|---------------------------------|
| Life jacket for each child and adult | Paddle for each child and adult |
| Life Ring | Emergency blankets |
| “Can you Find...” poster | Canoes |
| | Waterfront Radio |

• **Supplements**

- Supplement A: Canoeing Skills
- Supplement B: Background Information
- Supplement C: Talking Points
- Supplement D: Poster

Lesson Setup:

Take the waterfront radio and adult PFDs for the instructors 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 lead an introductory activity (see additional write-up). They will also talk about PFDs (personal floatation devices/life jackets) and ensure that all students and chaperones are fitted properly with a device. 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). The groups will then be directed to their activities.

Pre-Assessment:

1. Welcome the students to the activity and introduce yourself.
2. Ask students; How do you think the earth’s climate changes might affect the Indian Creek habitat? Do you think that any changes have already occurred on Indian Creek?

Motivation/Warm-up:

1. Engage the students by explaining that they will be going canoeing. Tell them they will be exploring Indian Creek at Arlington Echo by canoe and observing various shorelines found along the river and creek that may have been changed by man. They can also search for organisms found in that particular habitat.
2. Ask students to observe the poster. Can they observe how the shorelines may or may not have been altered by man? As they look at the water before them, can they see where these types of changes (bulkhead, riprap, living shoreline) have been made at Arlington Echo and/or by their neighbors? Why do they think man changed the shoreline? Walk along the path to observe where erosion has occurred behind the bulkhead. Can you find an area where a bulkhead may have been buried? This is evidence that Arlington Echo has restored a bulkhead to a living

shoreline. A living shoreline is where man has restored an unnatural shoreline such as riprap or bulkhead into a shoreline that resembles a natural state. Were the changes bad or good in the long run? Remind the students to observe the shorelines from the water while they canoe.

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 with the students*). **(See Supplement A)**
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 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.
8. You may have to direct or tow students whose canoe gets stuck in shallow water or along shoreline. Tell students not to 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 Supplement B)**

Notes for Clean up

Use the last group of adults and students for the day to help rack the canoes that were used during the lesson. Please organize and return the lesson folder, poster and life ring to the boat pier shed. The PFD’s are returned to the boat house near the Dining Hall and the radio should be returned to the Upper Resource lab or to Arlington Echo Staff. Remember to inform the Arlington Echo Staff if you need assistance or if any materials are damaged or missing. If there is another school using the canoes after your group, leave the canoes tied to the floating pier and the other materials where they are being used.

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 and alternate activity 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. Pass out the PFD that corresponds to the student's 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 they 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 your 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 while 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.