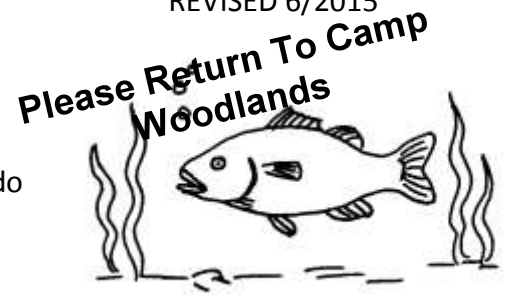


Lesson: Roots & Boots

Topic/Essential Questions: What lives in the water and how do trees keep the water clean?

Unit: Why Are Trees Terrific?“ Kindergarten Environmental Literacy



Content Standards:

- NGSS K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.
- NGSS K-ESS3-1. Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.
- NGSS K-ESS3-3. Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.
- Social Studies 3.0 Geography A. Using geographic tools B. Geographic characteristics of places and regions C. Modifying/adapting the environment.
- SL.K.1 Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.
- SL.K.6 Speak audibly and express thoughts, feelings, and ideas clearly.
- Foundation for EL Standards 1.0 Environmental Issues, 2.0 Interactions of Earth’s Systems, 4.0 Populations, Communities, and Ecosystems and 5.0 Humans and Natural Resources

Length of Lesson: 30 minutes *(The lesson begins with a 5-minute safety briefing with the entire group, followed by two 12-minute activities that are taught simultaneously. The group splits in half for the lesson and swaps after their first activity.)*

Student Outcome: The student will

- Identify animals that live in the water
- Describe how trees keep water clean

Knowledge of the Learner:

- Prerequisite Knowledge, skills and processes: trees and animals are living things with basic needs; listening, observing, following instructions
- Student needs, interests, previous learning: These will vary among students.
- Conceptual difficulties: relating map to real life, trees prevent erosion
- Differentiated: The instructor may pace the lesson according to the responses and participation of the students.

Knowledge of Content:

- Content knowledge for instructor: Provided in the text of the lesson.
- Vocabulary: PFD or personal flotation device, map, cove, stream, erosion, gills

• Resources:

Rowboats

Oars

Life-ring

Boat hook	Dip nets	Soil pan
Adult and child PFDs	Baited crab pot	Log prop
Map of waterfront	Aquariums	Small watering can
Boating safety poster	Gloves	2 shallow pans
Seine net	Hand sanitizer	Small tree in pot
Waders	Forest pan	

Pre-Assessment: During the opening at the beginning of the field trip, Camp Woodlands staff will invite students to share what they have learned at school about trees including trees as living things, trees as plants, parts of a tree, and what is a forest.

Activity A: Boating

Set Up Before Students Arrive:

1. Before the students arrive, the boating instructors should put on PFDs (life jackets) and place a variety of sizes outside of the boathouse in organized piles.
2. Put the boats into the water at the beach, practice rowing (*Face the back of the boat when rowing*), row to the dock and tie the boats to the dock at the cleats.
3. Place life-ring and boat hook on dock. (*Boats are flat bottom rowboats and **NOT** canoes.*)

Motivation/Warm-Up:

1. All students and adults should put on PFDs when they arrive. All adults should assist the students. PFDs should be clipped and tied.
2. Welcome students to the activity and introduce the instructors.
3. Show students the map and ask them what they think it's a map of. Ask students what the blue area represents (water); explain that the water they see is Broad Creek, which connects to South River, which connects to the Chesapeake Bay, which connects to the Atlantic Ocean. Ask students, "Who has been to the Chesapeake Bay?"
4. Ask students what the green area represents (land). Show the stream on the map. Ask the students what would happen if we dropped litter/trash near or in the stream. "*It would travel to the creek, then the river, to the Bay and maybe even the ocean.*"
5. Explain to the students that they will explore this area by going on a boat ride and by using seine nets to find out what lives in the water.
6. Explain the boating safety rules:
 - Wear a PFD (personal flotation device).
 - One student at a time gets into or out of a boat moving slowly and while holding a grown-up's hand.
 - Stay seated in the boat.
 - Don't lean over the side.
7. Divide the group in half: one half starts with boating and one half starts with seining.

Boating Procedure:

1. Before students are loaded into the boats, the rower should be seated on the middle seat facing the back of the boat. The safety person should kneel down and load students into

the boats one at a time while holding onto the boat with one hand and holding the student's hand with the other. (*If there is no "safety person," then a chaperone or teacher will need to become the safety person for their group, preferably during the safety and rules introduction.*) There should be **no more** than five students per boat.

2. Row into the cove. Invite students to tell you what they see. Encourage students to close their eyes then describe what they hear, smell and feel. They should not lean out of the boat, but they can feel the warm sun, the breeze and the movement of the boat.
3. Ask students to describe the land around the cove. *Slopes/Hills. Many trees.*
4. Explain to the students that the hills are made of soil (dirt) and rocks. Ask students, "What would happen if there were no trees?" *The soil would wash down the hill into the cove when it rains and make the water muddy.* This is called erosion. Trees help stop erosion. The tree roots hold the soil in place and help keep the water clean. "Let's thank the trees, Thank you trees!"
5. Row to the mouth of the stream and help students find the stream they saw on the map.
6. Return to the dock. Once again, the safety person should help students out of the boats one at a time following the same procedure of helping the students into the boat.

Assessment: Ask students, was the land around the cove flat or slope? *Sloped.* What is growing on the slopes? *Trees.* How do the trees help stop erosion? *The roots hold onto the soil, soak up water and filter.*

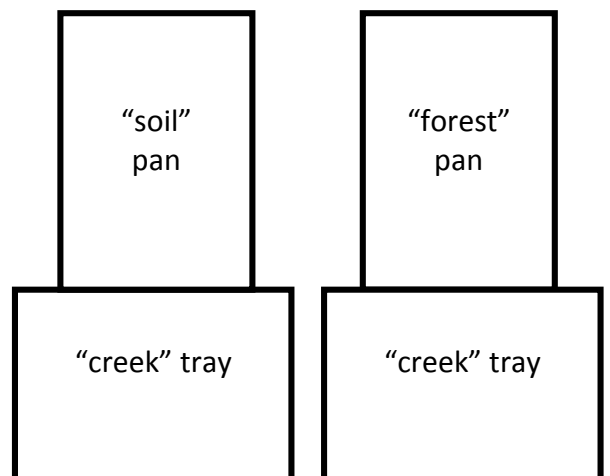
Activity B: Erosion and Seining

Set Up Before Students Arrive:

Instructors should remove their shoes and put on waders and PFDs, (*If your lunch is in the middle of the day, do not wear the waders up the hill*), unroll the seine net, fill the observation aquariums with **creek** water (*NOT fresh water*), set up erosion models according to the diagram under seining, prop up the pans on one end so that water will flow down into the trays, fill bucket with fresh water from hose, pull the crab pot from the water and place any crabs (*if there are some*) in one of the aquariums for observation by the students.

Erosion and Seining Procedure:

1. Ask students, "If you were a fish, would you like to live in clean water or dirty water?"
2. Show students the erosion model. Explain that they are going to perform an experiment. Explain that the pans represent two hills, one with trees, one without. The shallow trays are a creek or river at the bottom of the hills.
3. Ask students to predict (*guess*) what will happen when it rains on each hill.
4. Pick two students to be "rain clouds" and have them pour water with the watering can onto each hill one at a time; other students should make rain sounds. Have students describe what happens.



Which water is cleaner? Which hill had more erosion? Was your prediction correct?

5. Show students a potted tree. Gently lift the tree out of the pot to show the roots to the students. Ask students, "Why didn't the soil fall? What held the soil? *The roots*. Point out how the roots hold the soil. Return the tree to the pot.
6. Explain that trees growing near the water keep it clean. Their roots hold the soil in place. This helps the things that live in the water.
7. Between groups, pour muddy water into the woods where it will not drain directly into cove.

(Transition over to the beach to go seining)

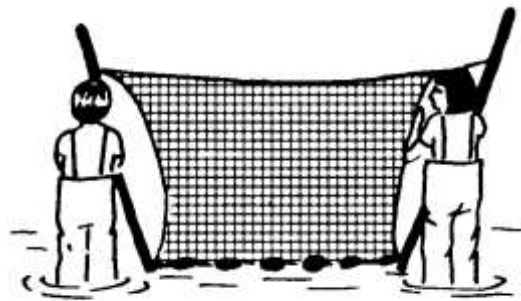
8. Ask students if they see any living things around the water. (They may see different kinds of birds: heron, seagull, duck, osprey, eagle.)
9. Ask students what animals might live in the water.
10. Inform the students that you are going to use the seine net to catch living things from the water for the students to see.
11. Two adult instructors should follow the procedure for seining. Refer to Seining Procedures.
12. Students should wet their hands on the net, pick up fish and shrimp and place them in the observation aquariums filled with water. The instructor may wear a glove to pick up jelly fish and crabs and place them in the observation tank.
13. If you don't catch anything in the seine net, use dip nets in underwater grassy areas and next to the bulkhead to try and catch grass shrimp.
14. When students have finished handling fish or shrimp, have them observe what they caught in the aquariums.
15. Use hand sanitizer to clean hands.
16. Cover any aquariums **before lunch**.
17. Release anything caught at the **end of the day** (*The last group can help with this*).

Assessment: Ask students, "How do trees help keep the water clean?" *Tree roots hold soil in place and prevent erosion.* "How do the trees help the things that live in the water?" *They help animals in the water by keeping the water clean.*

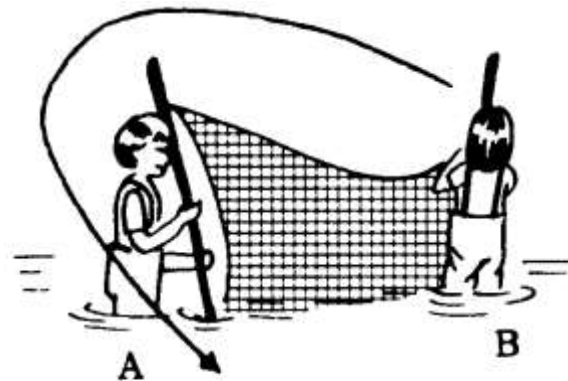
This activity will be cancelled and another activity substituted if there is thunder/lightning.

Seining Procedures

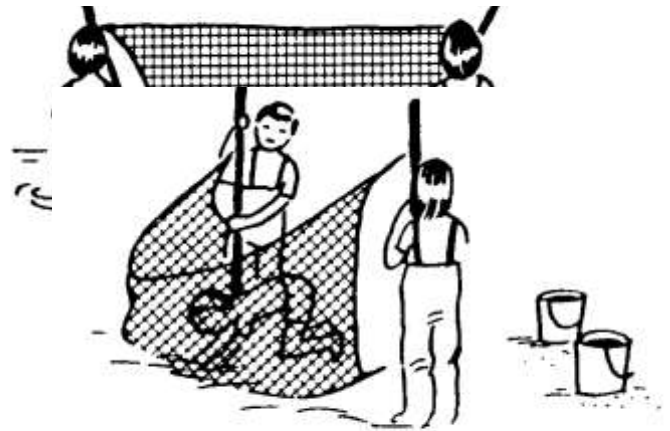
Step 1: Two adults carefully unroll the seine net with the weighted side on the bottom and the floats on top. Make sure weights are in contact with the creek bottom.



Step 2: Walk out to hip-deep water. Adult A stands still; adult B will walk in an arc around adult A, until both adults are facing the shore.



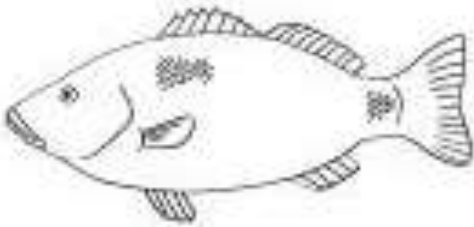
Step 3: Walk back to the beach tilting the poles backwards about 30° and bumping them along the creek bottom. Keep the net taut.



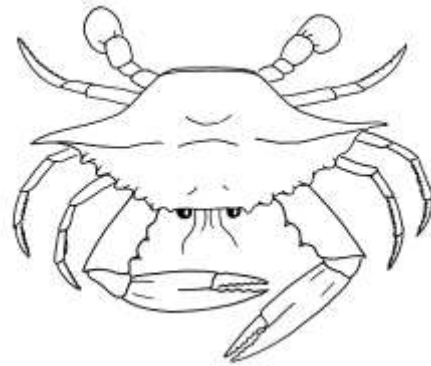
Step 4: Both adults walk slowly to shore, keeping

the weights on the river bottom. They should seine all the way up onto the shore then lay the net flat on the shore.

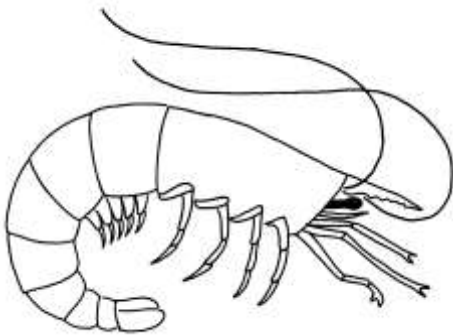
Broad Creek Aquatic Life



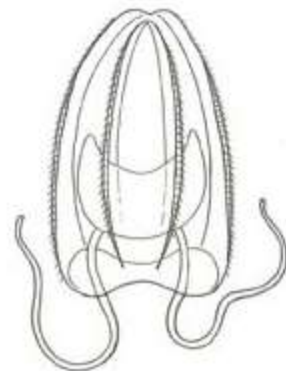
Fish



Blue crab



Grass shrimp



Comb jelly