

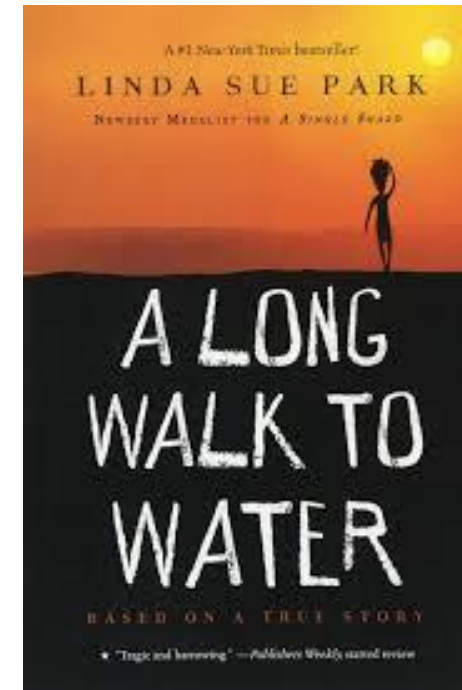
A LONG WALK TO WATER EXPEDITION

TEACHER GUIDE



PROGRAM OVERVIEW

- This two-hour, two-part program is based on the book A Long Walk to Water, by Linda Sue Park. The dual narrative documents the experiences of a fictional character and an international hero, both in South Sudan and in Rochester, NY.
- Students use both Seneca Park Zoo and Seneca Park to participate in a facilitated scientific field-study and a self-guided writing assignment which bring alive concepts related to both the story and the disciplines of Science, Social Studies and ELA.



LEARNING STANDARDS

NextGen & NYS P-12 Science Learning Standards:

- MS. Matter and Energy in Organisms and Ecosystems
- MS. Interdependent Relationships in Ecosystems
- MS. Human Impacts

Common Core:

- Writing: 6.3, 6.4, 7.3, 7.4, 8.3, 8.4
- Language: 6.1, 6.2, 7.1, 7.2, 8.1, 8.2



HOW TO PREPARE YOUR STUDENTS

Logistics

- Have your students split into groups of 15 or fewer.
- Assign 2-3 chaperones/teachers per group.
- Make sure that students are prepared for a hike and dressed for the weather (closed-toe shoes, raincoats, etc.).
- Bring pencils and clipboards for the self-guided Salva assignment.
- Provide name tags for students to wear.

Content

- If you haven't started reading [A Long Walk to Water](#), introduce the story to the students in advance.
- Pre-teach about macroinvertebrates and turbidity if your students aren't already familiar with those topics.



WHAT TO EXPECT WHEN YOU ARRIVE

- Your buses will pull up to the drop off area at the Front Gate.
- A Zoo staff person will check in your bus.
- You will check in at the Front Gate. Make sure that you know the total number of guests (students and teachers/chaperones) in your group. Have payment ready unless you have already submitted a purchase order.
- While you are checking in, a Zoo staff member will greet your group and give a brief presentation on Zoo etiquette and safety. Your group will enter the Zoo and wait at a designated flag area.
- The Zoo educator will take your first group and begin your Expedition. Subsequent Expedition groups will meet the Zoo educator at the Mural at the front of the Zoo at the times listed on the schedule provided to begin their Expedition.
- Some groups will be scheduled to complete the self-guided Salva assignment first and will be given their worksheets by the Zoo educator.



PART 1: FIELD STUDY WITH ZOO EDUCATORS

Essential Questions:

- How can we determine the water quality of natural water sources in our region?
- How does our access to fresh water differ from that of those who live in South Sudan?



PART 1: FIELD STUDY WITH ZOO EDUCATORS

Walk to Trout Lake

What to expect:

- Students will experience the challenge of carrying water to and from Trout Lake in Seneca Park.
- Students will use naturalist observations skills to locate water.

Notes:

- Students should be prepared for a hike by wearing closed-toe shoes.
- Students need to stay quiet so that we can observe as much wildlife as possible.
- Students need to stay on the trail for their safety.
- Be sure to dress for the weather!



PART 1: FIELD STUDY WITH ZOO EDUCATORS

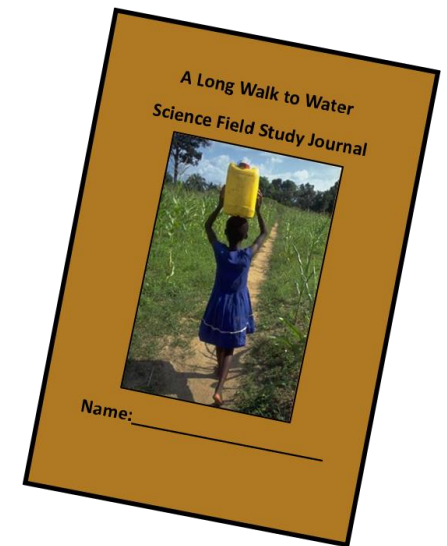
At Trout Lake

What to expect:

- Students will make observations.
- Students will complete water quality tests.
- Students will observe and identify macroinvertebrates.
- Students will make conclusions about the water quality of Trout Lake based on their observations and results from the water quality tests.
- Students will record their observations, data and conclusions in Field Study Journals provided by Zoo educators.

Notes:

- Students will be interacting with the lake water and should use caution to not get wet.



PART 2: SELF-GUIDED SALVA ASSIGNMENT

Essential Questions:

- Which animals at the Zoo are representative of the animals that live in South Sudan?
- How do writers use factual information to develop and create both fictional and factual narratives?



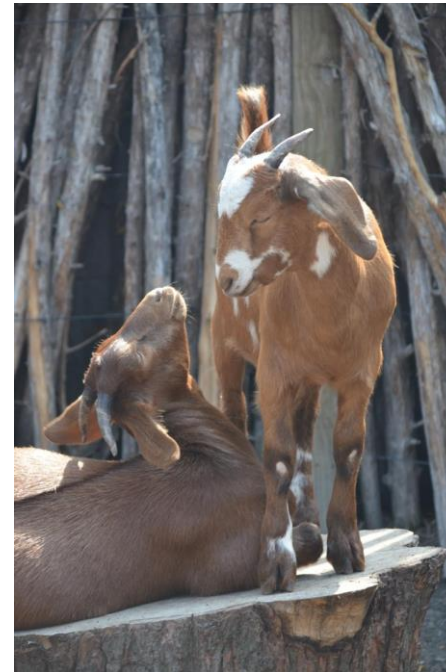
PART 2: SELF-GUIDED SALVA ASSIGNMENT

What to expect:

- Students explore Zoo grounds and identify animals that are mentioned in the book A Long Walk to Water.
- Students choose one animal to focus their observations on.
- Students record observations and develop a descriptive/sensory word bank on an observation sheet provided by Zoo educators.

Notes:

- Students need to have their own pencils/pens for this portion of the Expedition.
- It is helpful to bring your own clipboards for this portion of the Expedition.
- Students can use their observation sheet to complete a writing assignment back at school.



POST VISIT SUGGESTIONS

- Use the data collected during the macroinvertebrate test to determine the biotic index of Trout Lake (see Resources at the end of the Teacher Guide.)
- Compile the results from the water quality tests done during the field study. Have students work in groups of 3 or 4 to discuss and analyze findings. Write a summary that could be given to guests visiting the park.
- Have students complete a creative writing assignment using the observations collected during the self-guided Salva assignment. Examples include:
 - Write an essay from the perspective of one of the animals that you observed at the zoo describing a brief encounter with Salva on his journey across South Sudan.
 - Write a descriptive paragraph setting the scene and tone for a reader to experience what it might be like to enter into a habitat that you observed at the Zoo.
 - Write a factual descriptive essay on one of the animals you observed including their behavior, their adaptations, and their habitat.



RESOURCES

How to determine the Biotic Index of Trout Lake (post-visit activity):

- Transfer the number of macroinvertebrates observed from the Field Journal into the chart at right.
- Multiply the number of organisms by the assigned biotic index in the chart to determine the biotic value for the group.
- Add the biotic values of all the groups to determine your total biotic value.
- Add the number of organisms of all the groups to determine your total number of organisms.
- Divide the total biotic value by the total number of organisms to determine the Biotic Index of Trout Lake.
- Evaluate the Biotic Index of Trout Lake to determine how much impact humans have had on its water quality.

$$\text{Biotic Index} = \text{Total Biotic Value} / \text{Total \# Observed}$$

Macroinvertebrate	# Observed	Assigned Biotic Index	Biotic Value for Group	
Caddisfly		2		
Mayfly Nymph		2		
Water Penny		4		
Riffle Beetle		4		
Dobsonfly		4		
Dragonfly Nymph		4		
Crayfish		6		
Scud		4		
Fingernail Clam		6		
Sowbug		8		
Leech		7		
Midgefly Larva		6		
Aquatic Worm		9		
Mosquito Larva		7		
Blackfly Larva		5		
Total:		N/A		
Biotic Index	0-4.50	4.51-5.50	5.51-7.00	7.01-10
Human Impact	non-impacted	slightly impacted	moderately impacted	severely impacted



RESOURCES

1. Seneca Park Zoo <http://www.senecaparkzoo.org/>
2. Know Your Macros! – Slideshow for pre-teaching macroinvertebrates
http://www.nwnature.net/macros/docs/know_macros.pdf
3. Water for South Sudan <http://www.waterforsouthsudan.org/>
4. Project WET <http://www.projectwet.org/>
5. Aquatic WILD <http://www.projectwild.org/aquatic/>
6. Home Water Works <http://www.home-water-works.org/>
7. African Wildlife Foundation <https://www.awf.org/blog/how-does-water-use-unitedstates-compare-Africa>

