MANGROVES: MANGROVES IN OUR COMMUNITY

Grade 3

ESSENTIAL QUESTIONS: WHY ARE MANGROVES IMPORTANT?

- What are the physical characteristics of mangroves?
- What types of mangrove trees are most commonly found in local mangrove swamps? (gr. 3)

LEARNING GOALS

What should learners know and be able to do by the end of the lesson?

Students will be able to:

- Make observations of mangrove swamps, focus on mangrove trees (physical characteristics)
- Use line transect as a method to collect data on the
- Describe observations and data collection
- Create a report based on observations and collected data of mangrove swamp

Approximate Length of Lesson:
Three 45-minute class sessions; one-day field trip to mangrove swamp

Approximate Number of Minutes: 135 minutes in classroom; 480 minutes of field trip

BENCHMARKS

Sci.1.3.1 Make observations about objects and events and share their findings with others.

Sci 1.3.4 Work individually or in teams to collect, compare and share information, data, and ideas.

Sci.1.3.7 Use a variety of methods to record information.

Sci.4.3.4 Observe and identify common varieties of plants and animals around the school, home and elsewhere in the local environment, such as a forest, reef, or swamp.

SUMMATIVE ASSESSMENT

Illustrated observation report

FORMATIVE ASSESSMENT TOOLS

- Observations
- Discussions on observations and measurements

FOCUSED LANGUAGE FEATURES: VERNACULAR + ENGLISH

Language Functions	Related Sentence Structures / Patterns (Examples)	Vocabulary
Predict/Make a **hypothesis**	I/We think that _____. I/We predict that _____ because _____.	• Prediction • Names of different mangroves • Descriptive words for physical characteristics of mangroves
Describe living things	_____ looks _____. _____ is _____.	
Compare things in height	This mangrove tree is the tallest. This mangrove tree is shorter than that mangrove tree. That mangrove tree is taller than this mangrove tree.	

LEARNING SEQUENCE

Lesson: Mangroves in the community

Prior to Lesson	• Visit local mangrove swamp. Select a landmark such as a mangrove tree as a starting point • Set up line transects (around 20 foot long each, with 1 foot mark along the line) from that starting point. The line transects should cover an area of the mangrove forest. Label each line transect (e.g., Line Transect 1, Line Transect 2). • There should be enough line transects to assign one line transect to each pair of students. E.g., if you have 30 students in your class, there should be 15 line transects. • Map out locations of line transects from starting point for future reference. • Refer to fact sheet #1 for reference.
Activate Prior Knowledge	• Read aloud the essential questions for this lesson. • Give students some time to think about the questions. Ask for volunteers to share their thoughts. • Read a loud a local story about animals found in mangroves. Ask students why did people create a story about animals? (to make a literary record of animals observed in the mangroves) • Explain they will be making scientific observations at a mangrove swamp.
Build Background	• Introduce the word “observe” and explain meaning. • Explain to students that when we observe, we draw on the five senses (sight, sound, touch, taste, or smell). • Show pictures of different mangrove parts (roots, leaves) or real-life samples of real leaves from different mangrove trees. Make

	connection with learning from lesson 1 (different types of mangrove trees), and come up with descriptive words based on the five senses to describe them. Record the words.
Prior to visit to local mangrove swamp, go over the purpose of their visit with students	• Purpose: observe what the mangrove trees look like and different mangrove trees found at the mangrove swamp; record their observations on a template; draw a picture of observations. Discuss how to turn the purpose into guiding questions for their field trip. • Ask students what they predict to find at the mangrove swamp. Record their predictions. • Review observation template.

At the mangrove swamp	• Ask students the following questions: what is your first impression of the mangrove swamp? What does the environment look like? How does it look similar to/different from what you expect?
	• Demonstrate to students how to make observations along a line transect.
	• Pair up students and assign each pair to a line transect.
	• For each quadrant along the line transect, each pair counts the number of mangrove trees, observes the physical characteristics of mangrove trees, records their observations on template. When finished, they draw their observations along the line transect.
	• Monitor students and provide support if necessary.
	• When observations are completed, gather all students together. Point to the surroundings and discuss the following:
	  ○ Physical characteristics of mangrove trees (roots, leaves, size) and explain why they look the way they look (refer to fact sheet #1 for more information)
	  ○ Why mangroves grow in that area (brackish water)
	  ○ Why mangrove trees are very special trees (importance of mangrove trees to students and families; importance of mangrove trees for animals)

Reviewing and sharing of observations in classroom	• Review students' predictions.
	• Have students share out their observations and add new descriptive words to word bank
	• Discuss the different types of mangrove trees found in the mangrove swamp (if applicable. Refer to fact sheet #2 for reference)
	• Compare observations made along the transect line and ask questions such as:
	  ○ Which types of mangrove trees are most abundant? Where are they most abundant?
	  ○ Does the number of mangrove trees change as we moved away from our starting point?
	• Discuss the differences in height of the mangrove trees, and teach the language to compare height of the different trees (e.g., "This mangrove tree is the tallest. This mangrove tree is shorter than that mangrove tree. That mangrove tree is taller than this mangrove tree.")

	• Review the benefits we get from mangroves, identified from lesson 1 • Make connections to any existing law that restricts the size of the mangrove trees to be harvested, and discuss why such law exists (to prevent overharvesting and destruction of the mangrove swamp) • Based on the law, have students decide which of the mangrove trees they observed/measured would be ok to harvest, and which would not be.
Graphing Sampling Data	• Show students a sample pictograph, and explain the meaning of x-axis, y-axis. • As a class, pick one type of data observed (e.g., number of a type of mangrove trees in each quadrant). Label the graph accordingly (e.g., x-axis represents the quadrant number, and y-axis represents the number of trees) and plot the graph. • Discuss the graph: what relationship does it show you? Does it show a pattern? What conclusion can you make about the type of mangrove trees in the mangrove swamp? • Have students work with the same partner from the mangrove swamp to create graphs for their sampling data. • Have each pair share and describe a graph with rest of class.

Report on Visit to Mangrove Swamp	• Have students work with the same partners as their mangrove swamp visit
	• Write a short report on their visit to the Mangrove Swamp:
	  ○ Summarize their observations
	  ○ Include drawings from the observations
	  ○ Summarize learning from the discussion in classroom

Revisit K-W-L chart from lesson 2 and answer questions/record new learning	
Essential Question	Review the essential questions for this lesson. Ask for responses based on what we have learned.

RESOURCES

- Local story on animals found in mangrove
- Gr. 3: measuring tool; pictures or real-life samples of different mangrove plant parts such as roots and leaves; observation template; pencils to record observations and draw
- Heavy string, nails, and cardboard pieces or scarp wood for line transects
- Fact sheets on line transect (fact sheet #1) physical characteristics of mangrove trees (fact sheet #2), types of mangrove trees (fact sheet #3), and different animals living in mangroves (fact sheet #4)
- Paper to write report
- K-W-L chart from lesson 2