

LESSON 4: EXPLORING MARINE ECOSYSTEMS

SUMMARY

In this immersive lesson, students will explore their local coastal area on a scavenger hunt for items commonly found at the seashore. This activity is a way to introduce students to the flora and fauna that can be found along the coasts and to help participants explore what it means to be coastal citizens.

Next Generation Science Standard

MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

BACKGROUND INFORMATION

Living in the greater Miami community, we are fortunate to live in a robust coastal community! Miami-Dade County is internationally recognized for its beaches.

Along the coast are sensitive ecosystems including coral reefs, the Biscayne Bay, Everglade marshes, and coastal wetlands. These natural resources support fisheries, recreation, and tourism while also reducing erosion and flooding. Observing the local fauna and flora is a way to visualize our impact and influence on these ecosystems.

OBJECTIVES

Students will:

- Understand the concept of human impact on ecosystems.
- Investigate and collect evidence of human impact on the local beach.
- Construct an evidence-based argument on how activities affect the local beach.



LESSON PLAN EXPLORING MARINE ECOSYSTEMS

TIME

Part A: 90-120 minutes

Part B: 60 minutes

MATERIALS

- Scavenger hunt sheet
- Ruler
- Pen or pencil
- Clipboard
- Property cards

Part A: ENGAGE

Begin this activity by asking students to describe their local beach. What kind of things are there to do and see? Ask them about the different types of organisms they have encountered at the beach. Species may include shellfish, birds, seaweed, jellyfish, algae, seaweed etc... Explain to students that they will be participating in a scavenger hunt at a local beach. *Optional: Encourage students to take photos of their findings.*

Part A: EXPLORE

Divide students into teams. Each team should have their own clipboard with the scavenger hunt sheet, ruler, and writing utensils. *Optional: If you want students to collect trash as well, bring gloves & bucket to collect trash.*

When you arrive at your location, explain the boundaries for students. Make it a competition, the first group to complete the scavenger hunt, or collect the most items, wins. Have students record the data on their collection sheet. Remind students they are not collecting items, but observing them. *Observe, don't disturb!*

Part A: EXPLAIN

Once you're back in the classroom, ask each group to get together and present their findings to the rest of the class. Encourage students to take turns explaining why they chose each item to fit the corresponding description. Ask students where along the beach they found these items by showing them a visual of the intertidal, sublittoral, and coastal zones. Have students share any thoughts and discoveries made during the activity.

Part A: EVALUATE

Ask students to analyze the types of items they found. Have them create a short story of how one of these items made of debris ended up along the coast. The main character can be an empty bottle, fishing line, aluminum can, plastic bag, or other marine debris items. Have the students include the role a human plays in their story.

LESSON PLAN EXPLORING MARINE ECOSYSTEMS

TIME

Part A: 90-120 minutes

Part B: 60 minutes

MATERIALS

- Watershed map
- Property cards
- Pen or pencil
- Clipboard
- Property cards

Points for groups to consider:

- *Future use of the property*
- *Will the value of the property increase or decrease?*
- *Will you make money from your decision?*
- *How could this decision potentially impact local wildlife?*
- *How could this decision impact the other properties or the local community?*

Part B: ENGAGE

Start the lesson by asking students how they observed human impacts on their scavenger hunt.

Ask students if they know the difference between conservation and preservation. After taking answers, make sure students know that preservation refers to leaving land untouched and in its natural state, whereas conservation refers to responsibly managing land for human use. Ask students how do humans impact ecosystems.

Describe how ecosystem services are benefits humans obtain from ecosystems such as erosion control, climate regulation, or carbon storage. Ask students if they can give examples of ecosystem services a wetland provides. Answers may include flood control, water purification, or shoreline protection.

Ask students about the freshwater ecosystem in general. What value do they provide humans?

- *Dams for electricity*
- *Water for irrigation and drinking*
- *Food*

Part B: EXPLORE

Divide students into groups. Explain that each group receives a different property, all of which are on the same watershed. Students must decide as a group - will they conserve it or develop it?

Students should make a list of the pros and cons of each, and any potential impacts their decision may have.

Part B: EXPLAIN

Have each group elect a member to present their decision, a list of potential impacts, and a brief explanation of their reasoning.

After a brief discussion, ask the students whether or not they believe ecosystem services should be taken into consideration in the decision-making process. If so, how?

Part B: EXTEND

Optional: After discussing their decisions, have the students create a drawing of their property. What are some things they can do to reduce the impact the development would have on the environment?

Part B: EVALUATE

End the lesson by reiterating how important healthy ecosystems are to humans. Reminding students of the scavenger hunt they completed and their observations. Explain how marine ecosystems offer humans important services. Ask students about ways a developer or homeowner can lessen their impact on the environment.