CREATE A COASTLINE

Ages 6+

Learning Objectives

Students will be able to:

- construct a model of a coastline
- demonstrate and understand how how mangroves reduce the impact of wave action along coastlines.

Summary: This activity demonstrates the value of mangroves as buffer zones along coastlines.

Subject Area: Science, Art

Time: 60 minutes

Background: Mangroves provide many benefits to people, one of them being protection against hurricanes and big waves along the coast. Due to the location of coastal mangroves, these trees are usually our first land-based defense system to help protect against erosion and flooding. Mangroves have large root systems and are flexible, allowing them to absorb over 50% of a waves energy as it crashes on the shoreline. This activity allows students to observe the difference in flooding and erosion on two different coastlines, one with a mangrove buffer and one without.

Before the Lesson

- Ensure all necessary resources (or alternatives) are available.
- Prepare an area for the activity to take place that can get wet, water may splash out of containers during this activity.
- Explain to students what a wetland is and have them write down some ideas on what they think wetlands do for people, the environment and wildlife.

Materials

- Large, shallow pans (e.g., aluminum pans, greenhouse germination flats, or plastic trays), one per group of students
- Double sided tape or velcro
- Metal or glass water bottle
- Hair dryer (optional)

- Pipe cleaners
- A variety of craft/model-building materials: paper cups, toothpicks, cotton swabs, popsicle sticks, LEGO blocks, construction paper, etc.
- Natural materials including sticks, pine needles, small branches, leaves, etc.
- Sand to be used for your beach
- Fresh water
- Spoon or small shovel to disperse the sand

Activity - Create a Coastline

Procedure

1. Start by explaining that mangroves are very important buffer zones and can greatly reduce flooding and damage caused by crashing waves along a coastline.

2. Depending on the size of the class and amount of resources available, divide the students into groups of two or more. Give each group one pan, some sand and some crafting/building materials. Half of the groups will be building models **with** mangroves and the other half will be building models **without** mangroves.

3. Instruct every group to build a coastline model according to the following instructions:

- Spread a layer of sand in half the pan to represent land. Leave the other half of the pan empty to represent the ocean.
- Have students build structures on the 'land'. This could be a park, houses, beach huts, anything that you may find along the coast in a populated area. Encourage them to use the natural materials to replicate trees, bushes, gardens, etc.
- Now, have the groups that are building a model **with** mangroves add pipe cleaners to the edge (shoreline) of their 'land'. Use velcro or double sided tape to secure the pipe cleaners to the pan. The pipe cleaners will represent the mangrove buffer zone.
- Finally, add water to the empty side of the pan to represent the ocean.

4. Tell the students there is going to be a storm and have them replicate wind and waves in their models. This can be done one at a time so other students in the class can observe, starting with the models **with** mangroves.

5. Use the water bottle to make waves and the hair dryer to create wind.

6. After each group has gone, have the students note their observations of what happens to the different coastlines. [the beach with mangroves should remain intact with minimal sand erosion where as the model without mangroves should start to erode and the buildings on the beach may collapse]

Discussion/Reflection

- Ask the students the following questions:
  - What was the main difference observed between the model with mangroves and the one without?
  - Do they think having coastal buffer zones has a positive or negative impact on coastal areas during storms? [specifically flooding]
  - Why are wetlands important to people? [They can reduce flooding, prevent erosion, and help to clean our water.]
  - Can they think of any areas in their town or island that have suffered negative impacts that may have been reduced if there were mangrove buffer zones present?

References

- Mangrove Action Project, Marvellous Mangroves - A Wetlands Education Resource Book for the West Indies

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