

Maddy Krentz

Georgia Landforms

Grade 5

Beach Reclamation Lab - UPDATED!!!

Objective/Purpose: The purpose of this activity is to introduce the students to Georgia's many landforms (specifically the beaches/islands) as well as how they are made, how they are being destroyed, and what we are doing and what we can do to protect and reclaim them. This corresponds with the annual trip to Jekyll Island to see some of these techniques in person.

QCC Standards:

- **S5E1. Students will identify surface features of the Earth caused by constructive and destructive processes.**
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- **S5CS4. Students will use ideas of system, model, change, and scale in exploring scientific and technological matters.**
- **S5CS5. Students will communicate scientific ideas and activities clearly.**
- **S5CS6. Students will question scientific claims and arguments effectively**

Materials/Time Required:

- Large Tupperwares (enough for different demonstrations and then one for each group of students)
- Hose and access to outside water source
- Pitcher to fill with water for pouring on the islands
- Play Sand
- Rocks of different sizes
- Cotton netting and straw-like grass (for making sand dunes)

Background Information:

The idea for this experiment came from a demonstration given to my 5th grade class on our trip to Tybee Island. Before the experiment, we discussed all the constructive and destructive forces on Earth (including sand deposition/withdrawal by currents, organism impact, tides, etc). This activity was performed the week before they left on their trip to Jekyll Island so that they would have an understanding of the natural and unnatural destruction of the beaches of Georgia as well as the different efforts and methods to reclaim them.

Preparation:

This is an outside experiment (yay!) so make sure everybody has good shoes and sunglasses. This is not suggested for colder months because it includes water. Plan on having supplies for groups of students as large as you're comfortable having (I suggest 4-5). Plan on first demonstrating what happens to a beach that is just sand, then a beach with just sand and man-made dunes, and then finally a beach with sand, dunes, and a jetty or other rock protection. Pre-make your demonstration islands

and lay out all of the supplies for the students so that they can make their perfect island after seeing the demonstration.

Safety:

There's not much safety information. Just take the normal precautions of being outside and make sure no one throws the sand or wipes it in their eyes, and be conscious if it's windy that the sand doesn't blow in anyone's face.

Procedure:

During planning time, create the demonstration islands in Tupperwares. Try and keep the islands to one end of the Tupperware to better show what the current does to the sand it moves and make sure you protect your North side differently than your South side because that is how it is done on Georgia's coast because of the directionality of the currents. It helps to do research on the current beach reclamation techniques in order to make sure that you are getting materials to "fix" islands with that are relevant to current reclamation techniques. Sand dunes can be simulated by rope netting in the sand with some type of straw-like grass plant in it to simulate wild oats and other dune plants. Jetties can be made with pebbles. Other rock structures can be used to protect the North side of the island or they can be piled in a way that they will collect sand and extend the beaches.

For the experiment and demonstration, test your hose to find a pressure that is comparable to a current in the ocean (I suggest using a sharpie to mark the point where the pressure is the best so it can be the same every time). --The second time I did this, our hose had no pressure so we had to improvise. I got a pitcher of water with a spout from the classroom and we used that to pour measurable amounts of water into the Tupperware. This is much more easily controlled than the other method! – But you can keep the hose if you want to spray the kids with water or something afterwards. 😊

Gently add the ocean to your Tupperware without adding too much water (you'll add more later) and without disturbing the island you built. Explain what the different models represent and ask the students to hypothesize about which Island will survive the current best. You can also ask them to say what they think will happen to each island model. Once they've done that, you can gently you're your current into the Tupperware, focusing it around the North side of the island. The sand should only move a little at a time. Using the pitcher eliminated the chance that way too much current was ruining the island.

Now that you have finished the demonstration, let the kids go to their Tupperwares and various supplies, and challenge them to build an island that includes what they think are the most effective means of preserving an island. Once the islands are all built, you can test each of the islands to see which one holds up the best to current. Challenge the students to explain their choices. -This time I added a stipulation that the Island had to not only be protected, but that it should be aesthetically pleasing (including nice beaches), because we discussed in class that one of the reasons for protecting the beaches is to help the local economy. This made the islands much more attractive and it gave the students more to think about when they made their decisions.

Possible Questions:

- What are some reasons our beaches are getting ruined?
- What are some of the ways people are trying to save Georgia's beaches?

- Which of these ways do you think is most effective in preserving the beaches after doing this experiment?

Assessment/Evaluation:

The kids really enjoyed this experiment and loved going outside. Fair warning, this is best done in a group setting because of the nature of the comparison aspect of this experiment. If multiple adults are not present to keep outdoor activities controlled, I would advise against it unless students are very well behaved. My kids are awesome and there is a teacher and a student teacher to help keep things running well, so this was not an issue for us at all, but it's easy to lose control of the class with this lesson. I would have definitely gotten larger Tupperwares so that the kids could have been more intricate with their island designs but everything else was fine. **DEFINITELY USE THE PITCHER INSTEAD OF THE HOSE!!!** So much better!