



CHATHAM CONSERVATION FOUNDATION, INC.

540 Main Street • Chatham, MA • 02633-2239
508 945-4084
CCFinc@comcast.net
www.chathamconservationfoundation.org

Lesson Plans in Conservation of Earth's Natural Resources

Per the NGSS standards revision on April 16 2016

MA DESE template

Strand: Earth's Systems

Standards Covered: 7.MS-ESS3-2

Obtain and communicate information on how data from past geologic events are analyzed for patterns and used to forecast the location and likelihood of future catastrophic events.

Geologic events in our area could include flooding, deposition of sediments clogging rivers, beach and land erosion, etc.

Essential Question: How can we use information about weather-related events from the past to prepare us for ones in the future?

Introduction:

You may have experienced seasons that were exceptionally wet or dry, causing flooding on your street, erosion at your nearest beach and/or your bushes and lawns looking brown during a dry spell. Throughout history and around the world, human populations have been affected by wet and dry climatic cycles.

During the Dust Bowl era of the 1930's, wind and drought caused poverty and starvation for residents of the Great Plains states such as Kansas and Oklahoma.

During Hurricane Katrina which made landfall in Louisiana early on the morning of August 29, 2005, levees and floodwalls in New Orleans and the surrounding areas fell in more than 50 locations, flooding 80% of the city.

Content vocabulary:

Erosion, deposition, levee, sediments

Assessing Prior Knowledge:

WED (Weathering, Erosion and Deposition) is taught in 4th grade (4-ESS-1-1 and 4-ESS2-1). I suggest having the students, in small groups, complete a graphic organizer as a review of the vocabulary, since it has been a while.

Materials:

Clipboards or science notebooks, pens, Internet access

Procedure:

Activity: Following a rainy day, take your classroom outside to observe for signs of erosion. Has the soil been redeposited in an area? Have small sinkholes or gouges on the ground been formed? Are the storm drains clogged? You may also give a homework assignment to observe around their own homes and neighborhoods for signs of erosion.

Activity: Part 1: A research-based activity. Assign each student to research a method for wind (called "soil drifting") or water erosion control. They will find the following examples:

For Coastal Erosion:

- Seawalls of boulders
- Offshore breakwaters
- Vinyl barriers: I have a video of a company installing one in front of a house along the Bass River in Dennis and I talked with the crew. Glad to share pictures.
- Planting vegetation: dune grass or salt tolerant shrubbery
- Wooden pilings
- Gabion baskets: small stones rolled in large pieces of chicken wire
- Houses on stilts
- Discarded Christmas trees
- Sandbags
- Groins (or Groynes)

For Soil Erosion:

- Planting trees, meadowscaping, installing lawns to stabilize the soil
- Redirecting roof and storm water runoff
- Crushed stone
- Wood chips
- Hay bales: often seen on building sites or roadsides during construction

Part 2: After the students have completed their research and you have approved their progress: Each student will research the cost of their restoration project. The teacher and/or parent can help to estimate a fictitious (or real) piece of property: i.e. beach frontage in length of a house lot or a sloped front lawn of a house. We have many landscapers and coastal engineers on Cape Cod and I have found that most are eager to help local schools, or are parents of our students. The students will be astounded at the pricetag for some of these projects! Have the students present their findings to the class.

Results and Discussion:

1. With any renovation, there are pros and cons (advantages and disadvantages) to the project. What are they? Explain your answer.
2. Based on your research on your fictitious piece of property and the extreme patterns that weather can exhibit, do you think that your solution will work in the long term? Explain your answer.

Further Extensions:

After a natural disaster such as a home on the dune falling into the ocean during a storm, is the property owner allowed to rebuild and, if so, how is that funded?