



Barrier Island Dynamics

2018 - Driftwood Education Center



Class Description:

Study beach geology, barrier island dynamics, and tides right where it all happens: the beach! Students will gain a better appreciation for how landscapes change over time and the affect that has on the environment.

Appropriate for all grade levels including High School Students.

Driftwood Education Center
Po Box 20712 St. Simons Island, GA 31522
Phone: 912.638.3849 Fax: 912.634.0642
www.driftwoodee.org

Barrier Island Dynamics

Table of contents and outline:

I. Pre-class set-up

II. Introduction and overview (5 mins)

1. Welcome students to class and give overview.

III. The Georgia Bight (20 mins)

1. Discuss low energy waves, gentle slope of beach and tidal differences.
2. Do activities for each topic.

Concepts 1, 2 & Outcomes 1, 2, 3

IV. All About our Sand (10 mins)

1. Discuss origin of sand and sand dune formation and importance.
2. Do activities for each topic.

Concepts 1, 2, 3 & Outcomes 3, 4

V. Best Barrier Island Activity (15 mins)

1. Have students design the best barrier island.

Concepts 1, 2, 3 & Outcomes 3, 4, 5

VI. Longshore Current and Sand Movement (20 mins)

1. Discuss how the longshore current erodes and accretes our beaches naturally.
2. Discuss how the seasons and human influences change our beaches.
3. Act out all these factors using sand.

Concepts 1, 2, 3 & Outcomes 3, 4, 5

VII. Tides (15 mins)

1. Discuss how sand dunes are important to communities.

Concepts 2, 3 & Outcomes 3, 4

VIII. Conclusion & Wrap Up (5 mins)

Georgia Performance Standards met:

4th Grade:

1. **S4E2.** Obtain, evaluate, and communicate information to model the effects of the position and motion of the Earth and the moon in relation to the sun as observed from the Earth.

5th Grade:

1. **S5E1.** Obtain, evaluate, and communicate information to identify surface features on the Earth caused by constructive and/or destructive processes.

6th Grade:

1. **S6E2.** Obtain, evaluate, and communicate information about the effects of the relative positions of the sun, Earth, and moon

2. **S6E3.** Obtain, evaluate, and communicate information to recognize the significant role of water in Earth processes

3. **S6E5.** Obtain, evaluate, and communicate information to show how Earth's surface is formed.

7th Grade:

1. **S7L4.** Obtain, evaluate, and communicate information to examine the interdependence of organisms with one another and their environments.

Florida Science Standards

4th Grade:

SC.4.E.5.2 Describe the changes in the observable shape of the moon over the course of about a month.

SC.4.E.6.4 Describe the basic differences between physical weathering (breaking down of rock by wind, water, ice, temperature change, and plants) and erosion (movement of rock by gravity, wind, water, and ice).

6th Grade:

SC.6.E.6.1 Describe and give examples of ways in which Earth's surface is built up and torn down by physical and chemical weathering, erosion, and deposition.

Concepts:

Focal points of this class are:

1. The Georgia Bight affects our beaches.
2. Water and wind change and form landscapes.
3. People, plants, and animals are affected by and affect barrier island dynamics.
4. Tides are created and affected by the position of the Earth, moon, and sun.

Outcomes:

Upon completion of this class, students will be able to:

1. Understand that plate tectonics, water, wind, and weathering all affect changes in landscapes.
2. Explain the moon phases and the mechanisms behind the tides.
3. Explain how barrier island dynamics and humans interact with one another.

SC.6.E.6.2 Recognize that there are a variety of different landforms on Earth's surface such as coastlines, dunes, rivers, mountains, glaciers, deltas, and lakes and relate these landforms as they apply to Florida.

SC.6.E.7.4 Differentiate and show interactions among the geosphere, hydrosphere, cryosphere, atmosphere, and biosphere.

7th Grade:

1. **SC.7.E.6.6.** Identify the impact that humans have had on Earth, such as deforestation, urbanization, desertification, erosion, air and water quality, changing the flow of water.

South Carolina Standards met:

4th Grade:

1. **S4.E.3:** The student will demonstrate an understanding of the locations, movements, and patterns of stars and objects in the solar system.

5th Grade:

1. **S5.E.3:** The student will demonstrate an understanding of how natural processes and human activities affect the features of Earth's landforms and oceans.

8th Grade:

1. **S8.E.4:** The student will demonstrate an understanding of the universe and the predictable patterns caused by Earth's movement in the solar system.

2. **S8.E.5:** The student will demonstrate an understanding of the processes that alter the structure of Earth and provide resources for life on the planet

Next Generation Science Standards:

Grades K-5:

1. **4-ESS2-1** Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation

2. **5-ESS2-1** Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

3. **5-ESS3-1** Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Grades 6-8:

1. **MS-ESS1-1** Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.

2. **MS-ESS2-2** Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

3. **MS-ESS2-3** Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

4. **MS-ESS3-3** Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.