

**Connecting to the *Next Generation Science Standards* (NGSS Lead States 2013):**

The chart below makes one set of connections between the instruction outlined in this article and the *NGSS*. Other valid connections are likely; however, space restrictions prevent us from listing all possibilities. The materials, lessons, and activities outlined in the article are just one step toward reaching the performance expectation listed below.

**2-ESS2-1 Earth's Systems**

<https://www.nextgenscience.org/pe/2-ess2-1-earths-systems>

**Performance Expectation**

2-ESS2-1. Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.\*

**Science and Engineering Practices**

**Constructing Explanations and Designing Solutions**

Use observations from photographs and Google Maps to construct an evidence-based account of wind and water's effect on earth's surface and different solutions humans use to slow wind or water from changing the shape of the land.

Compare the results of modeled sea walls, sandbags, and dune grass barriers to determine which solution is best at slowing the erosion of a model coastline.

Plant dune grass as a solution to the real life erosion of the local coastline.

**Developing and Using**

Students distinguish between models and the actual sea

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| <b>Models</b>                                   | <p>barriers the model represents.</p> <p>Students compare before and after landform models of sand and soil to identify common patterns and differences in the effects of wind and water on their shape.</p>  |
| <b>Planning and Carrying Out Investigations</b> | <p>With guidance, students plan and conduct an investigation into whether or not wind and water affect the shape of landforms with peers.</p> <p>Students conduct an investigation producing data that serves as the basis to answering the question: Which barriers slow the effects of water on landforms best?</p> |
| <b>Disciplinary Core Ideas</b>                  |   |
| <b>ESS2.A: Earth Materials and Systems</b>      | <p>Students use real world photographs and classroom models to construct an evidence-based account of wind and water’s effect on earth’s surface and different solutions humans use to slow wind or water from changing the shape of the land.</p>  |
| <b>ETS1.C: Optimizing the Design Solution</b>   | <p>Students conduct an investigation producing data that serves as the basis to answer the question: Which barriers slow the effects of water on landforms best, recognizing the effectiveness of sea walls and dune grass before and during their field trip.</p>  |
| <b>Crosscutting Concepts</b>                    |   |
| <b>Cause and Effect</b>                         | <p>Students design and conduct simple tests designed to gather</p>  |

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|   | evidence supporting student ideas regarding how wind and water affect landforms.   |
| <b>Stability and Change</b><br>Things may change slowly or rapidly. | Students investigate how landforms are changed by wind and water, sometimes slowly and sometimes in sudden changes (like the collapse of a model sand landform).<br><br>They test model barrier solutions to slow the rate of change down and observe for changes to their models. |