

# Saving the Sand Dunes

## Unit Overview



### DRIVING QUESTIONS:

*Why are the changing dunes a problem? How can we protect the Sleeping Bear Dunes from changing?*

### ANCHORING PHENOMENON:

*The Sleeping Bear Dunes are changing.*

- *Students view photographs and maps of the Sleeping Bear Dunes. They read an article about how the dunes are getting smaller, and how this affects animals and people in the area. Throughout the unit students will investigate the problem to gather information about how wind and water change the earth over time. They will use their learning to design solutions that protect the dunes from changing.*

### STORYLINE

#### Section 1: Why are the changing dunes a problem?

Students investigate the problems caused by the changing Sleeping Bear Dunes. They engage in hands-on investigations to explain what is causing the dunes to change, and gather information on how the changing dunes affects the surrounding areas. They use evidence to support their explanations, and to define the problem caused by the changing sand dunes.

- DCI: Earth Materials and Systems, The History of Planet Earth, Defining and Delimiting Engineering Problems
- SEP: Asking Questions and Defining Problems, Constructing Explanations and Designing Solutions
- CCC: Stability and Change

#### Section 2: How can we protect the Sleeping Bear Dunes from changing?

Students engage in the engineering design cycle. They apply their learning of how wind and water can change the dunes to develop possible sand dune solutions. They investigate a variety of materials to use in their solutions. They develop, model, and test their solutions, and compare the results with other teams. Students use data as evidence to select a final sand dune solution and present it.

- DCI: Structure and Properties of Matter, Optimizing the Design Solution, Developing Possible Solutions
- SEP: Developing and Using Models, Analyzing and Interpreting Data, Constructing Explanations and Designing Solutions
- CCC: Cause and Effect, Structure and Function, Stability and Change

## OVERVIEW

<b>Introducing the ANCHORING PROBLEM and DRIVING QUESTIONS</b> (1 day ≈ 30 instructional minutes)	
ANCHORING PROBLEM The Sleeping Bear Dunes are changing. (1 day)	
<b>Section 1</b> <i>Why are the changing dunes a problem?</i>	<b>Section 2</b> <i>How can we protect the Sleeping Bear Dunes from changing?</i>
<i>Total Time: 13-14 days</i> LESSON 1 What are sand dunes and why are they important? (4 days) LESSON 2 Why are the dunes changing? (5-6 days) LESSON 3 How quickly can the dunes change? (4 days)	<i>Total Time: 15-18 days</i> LESSON 4 What can we do to protect the dunes? (5 days) LESSON 5 How can we make sure our designs work? (5 days) LESSON 6 How well does our design protect the dunes? (5-8 days)

**Unit 10 Teacher Guide** (version 7) *Saving the Sand Dunes*  
Washington University in St. Louis Institute for School Partnership