Changing Landforms: The Disappearing Cliff (Grade 2)

Opportunities for Unit Extensions

Field Trips and Other Resources

If time allows, you may wish to complement the content of this unit by organizing a student experience such as a field trip, a guest speaker, or even a virtual field trip. For the content of the *Changing Landforms: The Disappearing Cliff* unit, we recommend the following:

- After Chapter 1, organize a field trip to a local beach or region with easily accessible sand. Invite students to make observations of the size, shape, and color of the sand grains they find. Encourage students to use these observations as evidence of what the sand is made of, how it became sand, and how it got to that location, just as they did with their sand samples and the mystery sand in the book *Gary's Sand Journal*. You could also invite students to bring sand they have collected at other times to the classroom for the class to observe and compare.
- After Chapter 2, organize a field trip to a local river or stream or to a park with visible evidence of landform change. Encourage students to look for evidence of the impact of water on soil, sand, and rock. Pay particular attention to exposed rock layers as well as other rocks that may have broken apart as a result of contact with freezing and thawing or being hit by moving water.
- If your school has a garden, take your class to visit the garden anytime after Chapter 2. Encourage students to look for evidence of erosion caused by flowing water, such as small channels between rows of plants or deposits of different-colored soil or rocks. If your school has a garden teacher, you might invite him/her to talk to your students about how to mitigate the effects of erosion in the garden.
- Anytime throughout the unit, you might wish to take students on a virtual field trip of the geomorphic regions in your state. To find a virtual field trip, conduct a web search by using your state's name and "geomorphology."
- Invite guest speakers who address erosion within their field of work (e.g., geologists, coastal engineers, park maintenance workers, landscapers) to visit your classroom. You might encourage these speakers to talk to students about how they study or combat erosion in the work they do, as well as the career pathways they have followed in pursuit of this work. Guest speakers should be selected in such a way as to represent diverse demographic groups in terms of sex, gender, culture, ethnicity, race, sexual orientation, and persons with disabilities.

The experiences above could support the disciplinary ideas addressed in this unit, as well as practices such as Developing and Using Models and crosscutting concepts such as Scale, Proportion, and Quantity.

Media and Library Research Extension

Part 1: Information Literacy and Library/Media Research
Information literacy involves students' facility with identifying points at which additional information is needed and subsequently seeking out, assessing, and making use of relevant information to further understanding. Information literacy is particularly beneficial in the domain of science learning as it enables students to extend their understanding of a phenomenon under investigation.

Supporting students with effective use of library and media resources within and beyond your school setting is a key avenue for cultivating information literacy skills. Students' development of information literacy includes the following four components (Note: These are adapted from the Model School Library Standards for California Public Schools):

- Component 1: Accessing information
- Component 2: Evaluating information
- Component 3: Using information
- Component 4: Integrating information literacy skills into all areas of learning

In the next section, we offer suggestions for instructional strategies and learning activities as part of a research project to support students with these components of information literacy and to enhance students' learning about the central phenomenon they investigate in this unit.

Part 2: Research Project
At the end of the unit, students can work together in various grouping options to conduct a research project. You may choose to have students work together as a class, in small groups, or with a partner.

Identify what additional information is needed.
- Ask students to share the sources of information they have used to figure out the central phenomenon in the unit (e.g., texts, photos, videos).
- Set a question for further research.
  - **Option A:** Share a question relevant to the phenomenon that students have been investigating in this unit. For example:
    - *Choose a landform that you read about or observed in this unit. Where is this landform found? What bodies of water are found near this landform? What causes this landform to erode? Does this erosion process happen quickly or over a long period of time? Why?*
    - *Although sidewalks, streets, and parking lots are not landforms, they are often made of rock, just like the landforms you learned about in this unit.*

How do water and wind change sidewalks, streets, and parking lots over time?

■ *How are the plants and animals that live near a landform affected when the landform erodes?*

○ **Option B:** Invite students to generate questions they are still wondering about with respect to the central phenomenon they investigated. Then, have individual students, each pair of students, or each small group of students select the question they are most interested in researching. Guide students in selecting a question or questions they are most interested in researching. Gather resources that will support students in answering the selected question(s) and guide them in using the resources to identify the information that answers their questions.

Access information (Component 1)

● Invite students to share where they think they could find information to answer that question.
● Provide access to these sources (e.g., texts, magazines, newspapers, photos, videos, Internet) in your classroom, at your school library, or at the local public library. You might choose to collaborate with your school librarian on this project so he/she can support your students in finding the resources most relevant to their research question(s).

Evaluate information (Component 2)

● Have students evaluate the information from each source by addressing the following questions as the information is collected:
  ○ *Does this help us answer our question?*
  ○ *Which information that we collected is best for answering our question? Why do you think this?*
  ○ *What additional information do we need to help answer our question?*

Use information (Component 3)

● Provide students with a culminating opportunity to use the information they have gathered to answer their question. You might choose to create your own culminating project or choose from the following suggestions:
  ○ Have the class create posters or a newsletter for the school.
  ○ Have the class create an informational video or performance for the school, their families, or the community.
  ○ Have students use the information they collect to create a specific project related to the content they are studying (e.g., If students are studying habitats and collecting information about this topic, you might ask them to think about the information they have collected and decide together how to use this information to help them decide where to place new plants on the school grounds to support the local habitat.).

Integrate information literacy skills into all areas of learning (Component 4)

- Invite students to think of questions they have that are related to learning happening across other disciplines (e.g., math, social studies, art) and provide opportunities for them to engage in library and media research in these domains.

STEAM Extension

STEAM—science, technology, engineering, art, and mathematics—is an educational approach of integrating art and design into science, technology, engineering, and mathematics (STEM) disciplines. This integration is a natural extension of the ways that art and design overlap with STEM. Observing, visualizing, communicating, and problem-solving are all areas in which students can authentically engage in both art and STEM. A growing body of evidence shows that for students who are socially and economically disadvantaged, authentic engagement in the arts not only increases motivation and engagement, but also leads to greater academic achievement in STEM subjects. Integrating art and science can provide new opportunities for students who are typically underrepresented in STEM to understand and communicate science concepts, thus helping to address inequities in science and engineering.

Opportunities to engage in art and design happen naturally as students engage in science and engineering practices. Students engage in art as they draw careful observations of natural objects and events, develop models to communicate meaning, and think creatively to design solutions. When these natural connections to art arise in the STEM classroom, students should have the opportunity—supported through instruction—to create work of high artistic quality and to reflect not only on their science learning but also their artistic process. The following extension activity provides an additional opportunity for students to engage in STEAM.

At the end of the *Changing Landforms* unit, give students the opportunity to express through sculpture what they have learned about erosion. Discuss how creating a sculpture representing erosion will be different from when they used models to investigate erosion. When students used chalk as a model of a landform, their goal was to figure out how water can change landforms, so they modeled the process of erosion by spraying the chalk with water and observing how the chalk changed. The purpose of their sculptures is to represent how landforms change over time, and students will need to figure out how to show this through a sculpture that does not move or change. Encourage students to think about how to represent the dynamic process of erosion with a static medium. You could allow students to use the chalk or pom-poms from the unit to create their sculptures, or you could provide them with other materials, such as clay.