

## CLASSROOM ACTIVITY

# Moving Mountains

One paradox of geology is that weathering a mountain down can actually make it rise higher. Scientists have learned of this peculiar feedback process only in recent years, and the St. Elias Erosion/Tectonics Project (STEEP) team is at the forefront of understanding how climate and the movements of Earth's crust interact to build towering peaks. In this feature video, meet geologists of every stripe collaborating on STEEP in Alaska's St. Elias Range, one of the most rapidly growing mountain ranges in the world.

## CLASS DISCUSSION

### Establish Prior Knowledge

Review with students how mountains form. If necessary, direct them to this web site: <http://library.thinkquest.org/17701/high/tectonics/ptconv.html>

Discuss some of the factors that cause mountains to erode. Tell students that in the video they are about to see, scientists are collaborating to collect data that will help them understand how weathering and erosion can actually contribute to mountain building.

### Exploration

Before watching the video have students read the synopsis and use the interactive ([http://www.amnh.org/sciencebulletins/content/e.f.moving\\_mountains.20080401/resources/547/](http://www.amnh.org/sciencebulletins/content/e.f.moving_mountains.20080401/resources/547/)) to explore the St. Elias Range. Ask students to take notes while they are watching the video, noting the names of the scientists involved in the project and what kind of data each is collecting. Have students view the Feature. Use the following to guide a class discussion.

1. What is the St. Elias Erosion/Tectonics Project project investigating?
2. Why was the St. Elias range chosen for this study?
3. What tectonic processes cause the uplifting of the St. Elias range?
4. What weathering processes cause erosion of the St. Elias range?
5. What kinds of data are each of the following groups collecting?

- Structural geologists
- Geophysicists
- Sedimentologists
- Glaciologists

### Wrap-Up

Use the following question to wrap up your discussion:

- Describe how scientists think that erosion can aid in mountain building.

### The Scientific Method

Research scientists use the Scientific Method (see page two) to investigate the natural world. *Moving Mountains* can be used to illustrate how scientists collaborate to collect data that will help better understand how mountains build.

# Scientific Process

The Scientific Method is a dynamic and open-ended process that scientists use when they investigate a question they have. It is not a series of prescribed steps that scientists follow to prove a hypothesis. Rather, it's a general plan that helps guide their investigation. And while all scientists use the Scientific Method, they might not use all the steps, or they may complete the steps in a different order. For example, a scientist might make observations and collect data about a subject that interests him or her for years before formulating a hypothesis.

## DEFINING A QUESTION TO INVESTIGATE

As scientists conduct their research, they make observations and collect data. The observations and data often lead them to ask why something is the way it is. Scientists pursue answers to these questions in order to continue with their research. Once scientists have a good question to investigate, they begin to think of ways to answer it.

## FORMING A HYPOTHESIS

A hypothesis is a possible answer to a question. It is based on: observations scientists make, existing theories, and information they gather from other sources. Once they have a hypothesis, scientists can begin to think about how to test it.

## TESTING A HYPOTHESIS

Evidence is needed to support or disprove the hypothesis. There are several strategies for collecting evidence. Scientists can gather their data by observing the natural world, performing an experiment in a laboratory, or by running a model. Scientists decide what strategy to use, often combining strategies. Then they plan a procedure and gather their data. They make sure the procedure can be repeated, so that other scientists can evaluate their findings.

## ANALYZING THE DATA

Scientists organize their data in tables, graphs, diagrams, and even photographs. If possible, they check the data by comparing it to data from other sources. They are looking for patterns that show connections between important variables in the hypothesis they are testing.

## DRAWING CONCLUSIONS

Scientists must decide whether the data clearly support or do not support the hypothesis. If the results are not clear, they must rethink their procedure. If the results are clear, scientists write up their findings and results to share with others. The conclusions they draw usually present new questions for them to pursue.