

Middle School Standards

Standard: MS-ESS2. Earth’s Systems	
Performance Expectation: MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.	
Dimension	Classroom Connection
<p><i>Science and Engineering Practice</i></p> <ul style="list-style-type: none"> • Developing and Using Models • Analyzing and Interpreting Data 	<ul style="list-style-type: none"> • By manipulating the 3D printed models and making measurements to create their own mountain profiles, students will be able to create their own models of an actual landform. Explanation of how these models can be used to predict future climate change will help students understand why scientists create these types of models. • Students will be given real scientific data in the form of a 3D printed model, which they will need to determine how to analyze in order to “digitize” or create their own versions of the model.
<p><i>Disciplinary Core Idea</i></p> <ul style="list-style-type: none"> • ESS2.A: Earth’s Materials and Systems • ESS2.C: The Roles of Water in Earth’s Surface Processes 	<ul style="list-style-type: none"> • By discussing how the exposed mountainside they are working with was shaped by the movement and melting of glaciers over thousands of years, students will understand that the patterns and shapes of the land were formed or changed over very long timescales. Furthermore, by using the information about the shape of the rock that was under the glaciers, scientists can gain information about how glacier melting will affect future sea level rise. • By discussing the climatic changes between glacial and interglacial periods, students will get a sense of how the storage of water on the surface the Earth has changed over time. Furthermore, they will learn how the movement of this water, in the form of ice, is responsible for shaping many of Earth’s current landscapes.

<p><i>Crosscutting Concept</i></p> <ul style="list-style-type: none"> • Scale Proportion and Quantity • Systems and System Models • Stability and Change 	<ul style="list-style-type: none"> • By comparing the 3D printed models and an actual landscape, students will see a method that can be used to study small-scale details of a very large system that would be otherwise impossible to study in a laboratory setting. • By discussing how the information obtained from the 3D images can help determine future sea-level change, students will see how interconnected all the systems are. For example, the shape of the rock underneath a glacier can control how fast it slides down a mountain, enters the ocean, and eventually raises sea-level. • By discussing how the exposed mountainside they are working with was shaped by the movement and melting of glaciers over thousands of years, students will understand that geologic and Earth events often occur on very long timescales.
--	---