

History of the Earth - MS Unit

With a focus on the Champlain Valley

Classroom Component

In this middle school Earth science unit, students will learn about both the relative history and movement of the Earth. Students will develop and use models to describe how processes above and below the surface work together to cause movement. There are hands-on activities with rocks and fossils to explore how we can use evidence to reason how the earth used to appear. We will use many of the lessons and assessments from the OpenSciEd's [Unit 6.4: Plate Tectonics and Rock Cycling](#) as a basis for understanding.

They will also use multiple sources of data and information to build a timeline of Earth's history over 4.5 billion years, focusing particularly on regional Lake Champlain geology. Each student will be tasked with creating different 3-4 historical events to add to the timeline. This timeline will hang in the hallway for other students and families in the school to observe and interact with, and give the middle schoolers a chance to share what they are learning.

Field Component

This unit contains 4 field trips. First, we will visit the Hoover Street redstone quarry in Burlington to see both sedimentary rock and igneous rock, and explore how they tell a story of the age of each rock. The second field trip is to the UVM Perkins Museum of Geology, which has both worldly and regional exhibits to examine the watershed and geology, including relief maps, the skeleton of a beluga whale, and graphs representing Vermont's bedrock; they will complete a scavenger hunt to keep them engaged. Third, we hike at Rock Point to see the thrust fault, showing movement between different layers of rock. Finally, we will visit the Fisk Quarry and Goodsell Ridge Fossil Preserve in Isle la Motte to see evidence of ocean animals that used to live in this region.

Before each field trip, I have students do some research on where we're going and why, which helps them be more engaged. I rarely give them an academic task while on the field trip, but instead encourage them to play and engage with the place. After the visit, they complete another worksheet to share what they learned or thought was meaningful.

Resources

You can find links to investigations, timeline graphic organizers, field trip worksheets, and other supporting documents [here](#).

Standards and Practices

MS-ESS1-4: Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.

MS-ESS2-2: Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

MS-ESS2-3: Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

MS-ESS2-1: Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

NGSS Practices:

Asking questions

Developing and using models

Analyzing and interpreting data

Constructing explanations

Overarching questions (based on MWEE [framework](#))

Issue Definition	I am using OpenSciEd's lessons about Plate Tectonics & Rock Cycling. These help define the Earth's processes.
Outdoor Field Experience	Rock Point and the Hoover Street quarry show textbook movement and rock types. The Perkins Museum and fossil quarry field trips will help students imagine where Vermont and our watershed fits into Earth's history.
Synthesis and Conclusions	Students synthesize this information through building models and exit tickets with lessons, filling out field trip worksheets before and after the experiences, and creating the physical timeline throughout the length of the school.
Environmental Action Projects	<p>The timeline that students create will be shared with preK-5 students in our school, as the timeline will be hanging from the ceiling and on a wall for several weeks.</p> <p>In addition, we will plan a litter pick up at Rock Point, as it is frequented by the public.</p>

This unit was written and compiled by Lorraine Carter-Lovejoy, middle school science teacher at The Schoolhouse, in Spring 2025.