



**Lesson Plan**

**Theme:** Earth processes cause landscapes to change over time. Humans are dependent on these changes.

**Length of Lesson: 2 hours**

Introduction: 15 minutes

Field and Trailside Building Activities: 95 minutes

Conclusion: 10 minutes

**Minnesota Academic Science Standards/Benchmarks:**

- (5.3.1.2.1) - Explain how, over time, rocks weather and combine with organic matter to form soil.
- (5.3.1.2.2) - Explain how slow processes, such as water erosion, and rapid processes, such as landslides and volcanic eruptions, form features of the Earth's surface.

**Excellence in EE: Guidelines for Learning Standards:**

- Grades (5-8) - Strand 1 Questioning, Analysis, and Interpretation Skills, F) Working with models and simulations
- Grades (5-8) - Strand 2.1 The Earth as a Physical System, A) Name of subcategory

**Objectives (Students will be able to...):**

- Identify how weathering, erosion, and other Earth processes change landscapes over time.
- Explain how erosion and weathering transform rocks into soil.
- Describe how humans are dependent upon process that shape the Earth

**Background Information :**

All landscapes, from the highest mountain ranges to the deepest canyons, are affected by natural processes such as weathering and erosion. Sometimes the changes can happen very slowly, such as a glacier slowly advancing and carving out the landscape over thousands of years. Sometimes the changes happen quickly, such as a major flood eroding river banks or causing massive mudslides. Either way, the changes that occur forever change the way that humans interact with the land. In addition, the process of weathering, combined with the breakdown of organic matter, leads to the succession of rock into soil. These processes enable plants to grow, and in turn, terrestrial animals to live on Earth.

*Helping people discover, enjoy,  
understand, and preserve the incredible  
natural world that surrounds us.*

## Introduction:

**Goals:** Welcome students to River Bend, Introduce River Bend Leaders, Introduce program content

### Key Points

- Welcome to River Bend/Staff Introductions
- Introducing the “What, how, and why?” of the day
- Set River Bend expectations

## Activities:

### 1. Stream Table investigation

**Goals:** Introduce vocabulary regarding erosion along streams and rivers. Understand and demonstrate how the flowing of water causes erosion which changes the landscape .

### Key Points:

- Exploring the table
- Stream table as a model
- What? How? Why?

**Assessment:** Listen for both understanding and comprehension of vocabulary words, especially erosion. During the “what?”, “how?”, and “why?” portion of the activity, see if students can make connections on their own. Do they notice that their houses were undercut by the current and fell into the stream? Do they understand the connections between the model and the real world?

### 2. Glacial Erratic and Limestone Fossil

**Goals:** Recognize and demonstrate how glaciers carved our landscapes and deposited large rocks . Tell the story of Minnesota’s ocean and why we have fossils.

### Key Points:

- Tell glacial erratic story
- Tell fossil story

**Assessment:** Ask the students to explain the “what?” “how?” and “why?” regarding changing landscapes and glaciers. Do the students understand the process of glaciers carving lakes and depositing rocks. Ask the students to also explain the “what?” “how?” and “why?” of our ocean and the fossil.

### 3. River Exploration

**Goals:** Turn the understanding from the stream table into a bigger scale. Observe how the river has changed the landscape of River Bend. Discuss what the river has looked like in the past and how it changes seasonally.

### Key Points:

- Honor Point lookout
- Explore the beach
- Sandstone quarry

**Assessment:** Look for students' understanding of how the landscape was changed, and more importantly, why it is important to them. Are they able to connect back to the stream table? What do large changes in the Straight River mean for their community? If the program is being delivered to a large number of students and your group has not done the stream table before visiting the river, look for the connections after the stream table activity.

## 4. Limestone Quarry Exploration

**Goal:** Discuss and explain chemical weathering and how that changes our landscapes.

**Key Points:**

- Quarry exploration
- Chemical weathering experiment
- Discussion

**Assessment:** Allow students to make their own observations but listen for connections to previously covered material. By the fourth activity they should be using words like “weathering” and “erosion” correctly. They should be able to piece together what the landscape may have looked like previously based on what they understand about how landscapes change.

## 5. Soil Succession

**Goal:** Distinguish the different types of soil based upon visual and descriptive characteristics

**Key Points:**

- Soil exploration
- Soil, sand, rock, and compost comparison
- Discussion

**Assessment:** The students should be able to put it all together by this point. Without the processes of weathering and erosion, we would not have soil. Without soil, we wouldn't have plants. Without plants, we would not exist. We are able to live and sustain ourselves on the Earth because of these processes. If there are wild leeks in the area, drive the point home by allowing them to try a small piece.

