



**Lesson Plan**

**Theme:** Minerals are the building blocks of rocks. Rocks and minerals are found all around us and have distinguishable identifying characteristics.

**Length of Lesson: 2 hours**

Introduction: 10 minutes

Field and Interpretive Center (IC) Activities: 1 hour 40 minutes

Conclusion: 10 minutes

**Minnesota Academic Science Standards/Benchmarks:**

- 4.3.1.3.1 Recognize that rocks may be uniform or made of mixtures of different minerals.
- 4.3.1.3.2 Describe and classify minerals based on their physical properties.

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

- Grades (K-4) - Strand 2.1 The Earth as a Physical System, A) Processes that shape the Earth
- Grades (K-4) - Strand 2.1 The Earth as a Physical System, B) Changes in matter

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

- describe the differences between minerals and rocks.
- identify and sort rocks according to a variety of physical and chemical properties

**Background Information :**

Minerals and rocks are two related types of earth materials. Minerals are uniform solid materials with unique crystalline structure and chemical compositions. Minerals can be classified by their different physical and chemical properties. Rocks are made up of at least one mineral, so minerals are the ingredients in rocks. Rocks are identified by their mineral composition, or recipe. All rocks on Earth can be grouped into three main categories—sedimentary, metamorphic and igneous. Igneous rocks come from magma cooled either below or above ground. Sedimentary rocks form by deposition of grains of sediment over time that get buried and cemented into rock. Metamorphic rocks were igneous or sedimentary rocks that underwent great amounts of heat and/or pressure and were transformed into different rocks. The bedrock at River Bend is sedimentary rock from approximately 450 million years ago. However, during the last ice age, glaciers and later on glacial meltwaters picked up and moved around rocks, so we typically find other rock types besides the bedrock types in our streams and rivers (See Appendix C and Resources for more information about River Bend's and Minnesota's geologic history.)

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

## **Introduction:**

**Goals:** Welcome students to River Bend, introduce the River Bend leaders, and introduce the program content.

### **Key points:**

- Welcome
- Why are rocks and minerals important
- Explain the difference between rocks and minerals
- Set expectations for the day

## **Activities:**

### **1. Mineral identification**

**Goal:** To learn some different techniques for identifying and testing minerals as well as become familiar with some common minerals.

### **Key points:**

- Students will work in small groups to test minerals while guided by a worksheet.

**Assessment:** Once students understand the basic mineral identification process you should be able to watch their methods and determine their level of understanding. A quick verbal quiz on the differences between minerals will determine if they are understanding the differences the testing indicates.

### **2. Rocks and Minerals Formation (active game)**

**Goal:** Students will understand that minerals compose rocks and that various combinations of minerals lead to different types of rocks.

### **Key points:**

- Students will be assigned to teams that represent a specific mineral.
- Once the desired rock type is revealed students must work together to locate the appropriate minerals to form the desired rock.

**Assessment:** Ask students to explain what rocks are made of and how you get different rock types.

### **3. Rock Field Study: (active learning)**

**Goal:** Student will examine rocks and work together to hypothesize what minerals make up that rock.

### **Key Points:**

- Students use real life examples to solidify what they've learned throughout the day.

**Assessment:** Challenge students to bring you rocks that are made up of a certain mineral.