

# Mysteries

## Objectives

Students Will Be Able To use the scientific method to answer questions about fossils.

Objectives will vary depending on which mystery students work on:

◆ **Florissant's Past:** SWBAT draw conclusions about Florissant's past based on evidence.

◆ **Fossil Types:** SWBAT compare and contrast types of fossils.

SWBAT explain how the formation process affects what type of fossil is formed.

◆ **Florissant's Wildlife:** SWBAT describe the current ecosystem of Florissant Fossil Beds National Park.

◆ **Ancient Climate:** SWBAT draw conclusions about the Eocene climate based on evidence.

◆ **Fossil Research:** SWBAT formulate hypotheses, gather evidence, and draw conclusions using fossils as evidence.

◆ **Research:** SWBAT summarize research that has been done at Florissant Fossil Beds National Park.

◆ **Fossil Origins:** SWBAT describe two processes of fossil formation.

◆ **Changing Climates:** SWBAT draw conclusions about how and why the climate has changed in the Florissant area from the Eocene to today, based on evidence.

◆ **Eocene Elevation:** SWBAT draw conclusions about whether or not the elevation at Florissant Fossil Beds National Park has changed since the Eocene, based on evidence.

## Inquiry Questions

1. How is a scientist's question about the world similar to a mystery that might be solved by a detective?
2. What process does a scientist go through to answer a question or solve a mystery?
3. What questions might a scientist have about fossils?

## Materials

- ◆ *Views of the National Parks* CD
- ◆ Printed Investigator's Reports

**Procedure (Part One)**

1. If students have not had a chance to explore the *Views* CD, allow them some time to explore on their own or in small groups.
2. After students have looked at the disc in general, ask them to find and explore the **Florissant Fossil Beds Module**. (At the Visitor Center, click on "Virtual Experiences," then on the "Florissant Fossil Beds" button). Encourage students to watch the short movie.
3. Direct students to the "Mysteries" section of the Florissant module. (On the Introduction page, you will see the word "Mysteries" in three different places. Click on any one of these.)
4. Students should click on "Next," and continue clicking on "Next," as they listen to the introduction to the Mysteries section. Students will know they are finished with the introduction when they come to the page titled "Available Cases."
5. Hints for working through the cases:
  - ◆ The Available Cases are divided into three leveled sections. Students can work their way through the cases from easier to more difficult, or can be assigned a case based on ability.
  - ◆ It might be helpful to work through one of the mysteries together before assigning individual students or small groups to work independently.
  - ◆ To begin a mystery, click on a case to open the case file. Read the observations.
  - ◆ Click on the "Ask" button. Students might have their own questions to add to the list.
  - ◆ Click on the "Plan" button. Read the information, then click on "Open Investigator's Report."
  - ◆ The Investigator's Report should be printed at this point. Students will fill the report out as they progress through the mystery.
  - ◆ The Investigator's Report has several sections:
    - Case Information – What do you already know about the topic?
    - Questions and Hypotheses – What does the scientist/detective want to find out? Students write the answers the questions on the Investigator's Report, forming their hypotheses.
    - Evidence – Where to look for the answers to the questions. Links are provided from the case file. Students write the applicable evidence on the Investigator's Report.
    - Results and Conclusions – Does the evidence gathered support the hypotheses? Students write their conclusions.
  - ◆ After printing the Investigator's Report, click on "Leads" to find the links that will provide the evidence needed to complete the Investigator's Report.
  - ◆ Next, click on "Reports" to find directions for completing the Investigator's Report.
  - ◆ The "Agency" button will link you to other Mysteries, if desired.

6. After students have had the opportunity to work through a Mystery, discuss the process. Ask: How is the work scientists do similar to the work detectives do? What evidence did you gather to support your hypothesis? What other scientific questions could be answered using this method? Could other types of questions be answered using this method? What did you learn about fossils?
7. If students did not all work on the same Mystery, allow some time for students to share their learning with each other.

### **Key Vocabulary**

- ◆ Ecosystem
- ◆ Eocene
- ◆ Hypothesis
- ◆ Petrified
- ◆ Fossilized

Vocabulary will vary depending on which mystery students solve.

### **Discussion Questions**

1. How is the work scientists do similar to the work detectives do?
2. What evidence did you gather to support your hypothesis?
3. What other scientific questions could be answered using this method?
4. Could other types of questions be answered using this method?
5. What did you learn about fossils?

**Assessment**

Students Will Be Assessed On ...

1. Participation in classroom discussion and other activities.
2. Completed Investigator's Report.

**Differentiation**

To best meet all students' needs, we suggest ...

1. If the Investigator's Reports are completed in groups, use heterogeneous grouping so that more advanced students can be of help to their teammates.
2. Providing sentence starters or fill in the blank sentences on the Investigator's Report.