

## Investigation Five – Fossil Maps

<b>Standard IV</b> Students will understand how fossils are formed, where they may be found in Utah, and how they can be used to make inferences.
<b>Objective 1</b> Describe Utah fossils and explain how they were formed.
<b>Objective 2</b> Explain how fossils can be used to make inferences about past life, climate, geology, and environments.
<b>Intended Learning Outcomes</b> <ol style="list-style-type: none"><li>1. Use science process and thinking skills</li><li>2. Manifest Scientific attitudes and interests</li><li>3. Understand science concepts and principles</li><li>4. Communicate effectively using science language and reasoning</li></ol>

### Standard IV

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Objective  
1  
Objective  
2

### Background Information

There are many different locations and many different types of fossils which have been found in Utah. Knowing where in the State of Utah these fossils were found and knowing what kind were found where, can help us to draw inferences about Utah's past environment and inhabitants.

Fossils indicate that life on Earth has not always been as it is now. More Than 500 different trilobite species have been found across the western portion of Utah. Sea life fossils have been found in Millard, Box Elder, Tooele, Iron, and Garfield Counties. Trilobites are probably the most common fossils collected in Utah. These fossil finds infer that much of western Utah was covered by shallow sea. It is thought that Utah was located near the equator during the Cambrian period. This would have caused the water temperature to be warm. It would also have caused Utah's climate to be tropical. Warm, shallow water and nutrient-rich silt would have allowed marine life to thrive.

Fossils of sea creatures two or three times older than the dinosaurs have been found in Uintah County. Although sea creature fossils have been found in Dinosaur National Monument, it is best known for its spectacular and easily accessible dinosaur localities. This site has produced several complete dinosaur skeletons as well as thousands of bones. It was called one of the best Jurassic Parks in the United States. About 145 million years ago this area was a suitable habitat for dinosaurs. It was a low-lying plain crossed by several rivers and streams. Plant life was abundant. Many animals lived and died here. Most decayed without a trace. There was one area though, where river floodwater washed carcasses and bones onto a sandbar. The bones were preserved in the sand, making this one of the premier fossil sites in North America.

During the same time period, Emery County was a shallow freshwater lake with a muddy bottom. Dinosaurs who fed and preyed here were occasionally trapped in the mud. Over the years, the skeletons and bones of these animals accumulated. This area is one of the world's most important sources of dinosaur fossils. More than thirty complete skeletons, 12,000 individual bones and several dinosaur eggs have been unearthed at the Cleveland-Lloyd quarry.

Grand County is rich not only in the number of dinosaur bones that have been found but in the number of different types of dinosaurs which have been preserved. The Utah Raptor was discovered in the desert near Moab, Utah. Dalton Wells Dinosaur Quarry has a large number of bones from many different types of dinosaurs both juvenile and adult. It is a massive dinosaur graveyard. The bones were deposited on the flood plain by a volcanic ash-choked stream.

## Pre-Assessment/Invitation to Learn

### Materials

- Internet hook up and projection of [www.dinotrax.com/index.html](http://www.dinotrax.com/index.html) or overhead transparency copies of dinotrax.com background/questions and answers
- Lined paper
- Printed copy of dinotrax.com information (optional)
- Research Chart to record information on
- Research material – books, articles, Library access
- See Additional Resources for possible Web site locations and links
- "Counties of Utah" map

1. Connect to and project Dinotrax.com. (Use overheads if technology is not available.)
2. Read the introductory information on this recent dinosaur find.
3. Have the students think, pair, share what they think was the most important information in this article. Have them share their pair responses in groups of four.
4. Project and read the question and answer portion with your class.
5. Working in pairs, have the students sort the sequence of events both the physical events and thought process that Dr. Johnson went through as he made his discovery. If necessary give the students the printed copies of the Dinotrax.com information to reference.
6. Have them classify the information from the article into categories that would help them in doing research.

## Instructional Procedure

This activity can be teacher-directed in the classroom or individually completed in the computer lab.

1. Pass out the "Counties of Utah" map and the "Research Chart" paper.
2. Go to the Web site: [t4.jordan.org/grade\\_level/fourth/science/s4\\_4html](http://t4.jordan.org/grade_level/fourth/science/s4_4html) and click on the "Utah Fossils Map". It will download on your desktop.
3. Open the "Utah Fossil Show" document on your desktop. Push enter to get the map of Utah.
4. Follow instructions to find information about fossils found in various areas in Utah.
5. Record information on the "Research Chart". Do as many as you can in the allotted time.
6. Students can also research where fossils have been found in Utah using books, articles, and the internet. (See Resources List 11.2.25)

7. Construct a simple map of where fossils have been found in Utah using the included map on page 11.2.20.
8. Make a map key or legend to explain your map.

## Curriculum Extensions

### *Language Arts –*

- Find and use information about fossil finds in Utah in a report. (Standard VIII, Objective 6)
- Read books that tell about the fossils that we have in Utah. Find out how they were made and the conditions that existed. (Standard VII, Objective 2)

### *Fine Arts/Visual Arts –*

- Make a model of a fossil which was found in one of Utah's counties. Have them write important facts they have learned about that fossil in their own words. (Standard III, Objective 2)

## Assessment Suggestions

- Have the students draw a picture of what they think Utah would have looked like 145 billion years ago. Based on the fossils found in various locations, infer how Utah's environment has changed over time. The drawings should be based on the information you learned from your research about the location and types of fossils that have been found. Include the types of plants, animals, and climate you think would have been prevalent.

## Resources

### *Web sites:*

- [www.ugs.state.ut.us/surveynotes/gladasked/trilobites.htm](http://www.ugs.state.ut.us/surveynotes/gladasked/trilobites.htm)
- [www.dinosaurweb.com](http://www.dinosaurweb.com)
- [www.dinotrax.com](http://www.dinotrax.com)
- [www.carbonk12.ut.us/che/jewkes.htm](http://www.carbonk12.ut.us/che/jewkes.htm) Utah Fossil Map, Fossils in Utah Where are they?

## Homework and Family Connections

- Have the students take the maps home that they drew to explain to their families the different places and types of fossils that are found in Utah.
- Have the students explain to their families the different types of climates that have existed in Utah, explaining why we have the fossils that are found.
- Check out fossil books from the library. Have the students read it to their parents or family members.

# COUNTIES OF UTAH



Name \_\_\_\_\_

Date \_\_\_\_\_

### Research Chart

<b>County</b>	<b>Fossil</b>	<b>Type of Environment/ Climate it would Live in</b>	<b>Important Facts</b>