

What Did You Find?

Science Standard IV

Objective 2

Connections

Standard IV:

Students will understand how fossils are formed, where they may be found in Utah, and how they can be used to make inferences.

Objective 2:

Explain how fossils can be used to make inferences about past life, climate, geology, and environments.

Intended Learning Outcomes:

1. Use Science Process and Thinking Skills
2. Manifest Scientific Attitudes and Interests
3. Understand Science Concepts and Principles
4. Communicate Effectively Using Science Language and Reasoning

Content Connections:

Language Arts VII, VIII; Social Studies I

Research Basis

Fountas, I. C., Pinnell, G. S. (2001). Guiding Readers and Writers Grades 3-6. *Teaching Comprehension, Genre, and Content Literacy*, Chapter 15.

Literature study contributes to student learning in five ways: expanding reading comprehension strategies, learning to think critically, appreciating the aesthetic qualities of literature, developing communication skills, and extending writing skills.

Marzano, R.J., Pickering, D.J., & Pollock, J.E. (2001). *Classroom Instruction That Works: Research-Based Strategies for Increasing Student Achievement*, Chapter 3.

Summarizing and note-taking are two of the most useful academic skills for students to cultivate. They provide students with tools for identifying and understanding the most important aspects of what they are learning.

Assessment Suggestions

- K-W-L chart in student journals
- *Science Writing Rubric*

Invitation to Learn

Have students say the tongue twister, “She sells seashells by the seashore” three times as fast as they can. Tell them that it is about Mary Anning, who grew up in the early 1800’s on the coast of England. She collected shells to sell in her father’s souvenir shop. When she was only 12 years old, she discovered her first fossil skeleton. It was a dolphin-

like reptile called an Ichthyosaur. She found many other marine fossils during her life that are now displayed in museums all over the world.

Instructional Procedures

1. Students make a K-W-L chart in their journal.
2. List things that they know about dinosaurs and fossils in the “K” column.
3. Write questions about dinosaurs or fossils in the “W” column that they would like to find answers to (e.g., Why did the dinosaurs and other prehistoric organisms become extinct?).
4. Read information from the *Dinosaur Track Pack* and *The Story of Sue* handout.
5. Students list what they learned in the “L” section of the chart.
6. Students meet in small groups and share what they learned from their reading.
7. Share an example of what a report about the history of dinosaurs would look like.
8. Students write a 300-word (one page) report about the history of dinosaurs. It should include information that students learned from their research.

Curriculum Extensions/Adaptations/Integration

- Students use the Internet to search for information about other paleontologists, such as Othniel Charles Marsh who made many discoveries in the 1860’s.
- Students illustrate their reports with their own drawings or pictures from the Internet.
- Some students may need to sit up close to see the pictures and other items in the *Dinosaur Track Pack*.
- Students may work in groups or with a partner to read *The Story of Sue*.

Materials

- Dinosaur Track Pack*
- The Story of Sue* handout
- Science journal
- Science Writing Rubric*

Resources

Books

Geology Rocks!: 50 Hands-On Activities to Explore the Earth, by Cindy Blobaum; ISBN 1-885593-29-5

The Dragon in the Cliff: A Novel Based on the Life of Mary Anning, by Shelia Cole; ISBN 0688101968

Dragon in the Rocks: A Story Based on the Childhood of the Early Paleontologist, Mary Anning, by Marie Day; ISBN 1895688388

The Fossil Girl: Mary Anning's Dinosaur Discovery, by Catherine Brighton; ISBN 0761314687

Ichthyosaurus and Little Mary Anning, by Brooke Hartzog; ISBN 0823953262

Mary Anning and the Sea Dragons, by Jeannine Atkins; ISBN 0374348405

Mary Anning: The Fossil Hunter, by Dennis Brindell Fradin; ISBN 0382394860

Rare Treasure: Mary Anning and Her Remarkable Discoveries, by Don Brown; ISBN 0395922860

Stone Girl, Bone Girl: The Story of Mary Anning, by Laurence Anholt; ISBN 0531301486

Web site

The Field Museum has the story of Sue, along with pictures and online activities. www.fieldmuseum.org

Family Connections

- Take a family fieldtrip to one of the many places where fossils have been found or displayed in museums throughout the state of Utah.
- As a family, create a fossil and shell collection in the home from visits family members have made to a seashore.
- Read books together about dinosaurs, fossils, and famous paleontologists.

The Story of Sue

Sue is a funny name for a dinosaur, especially a Tyrannosaurus Rex. She lived nearly 67 million years ago, according to what scientists believe. When she died, her body was covered by mud and sand. Over time, the hard parts of her body were replaced by minerals.

Sue's fossil remains were discovered in 1990, near Faith, South Dakota. The person who discovered them was with a team of fossil hunters. She stayed behind while they went into town to fix a flat tire on their truck. As she hiked over to some sandstone bluffs nearby, she saw the fossil bones sticking out of the ground. When her team returned, they decided to name it Sue, in her honor.

It took five years to sort out who owned the land and had the rights to claim Sue's remains. It was finally decided that they belonged to a rancher who owned the property Sue was found on. He decided to sell Sue at a public auction. The new owner was The Field Museum in Chicago. With the help of several sponsors, Sue was purchased for \$8.4 million- the most ever paid for a fossil.

Each of Sue's 200 plus bones had to be carefully removed from the surrounding layers of rock and soil. It took over 25,000 hours of work by many individuals to clean and repair her bones for display at the museum.

Sue is the largest, most complete, and best preserved T. Rex fossil ever discovered. She stands 13 feet high at the hips and is 42 feet long, from head to tail. It is estimated that she would have weighed nearly 7 tons when she was alive. Her head alone was 5 feet long, and some of her teeth measured 12 inches!

Science Writing Rubric

	Excellent	Fair	Needs Improvement
Organization & Presentation	Main ideas are clearly presented. Ideas are presented in an appropriate order. Ideas are supported by information and logic. Appropriate conclusions are based upon evidence presented. Effective use of models, diagrams, charts, and graphs.	Main ideas are presented to some extent. Ideas are not presented in an order that adds clarity. Some ideas are supported by information and logic. Conclusions do not follow from ideas presented. Some appropriate use of models, diagrams, charts, and graphs.	No main idea presented. Ideas are presented in an order that distracts from clear communication. Ideas are not supported by information and are illogical. Inappropriate conclusions are presented No use of models, diagrams, charts, and graphs.
Use of Science Language	Consistent use of appropriate science language and terminology.	Partial use of appropriate science language and terminology.	Inaccurate use of science language and terminology.
Science Content	Accurate. Connected to big ideas in science.	Mostly accurate. Connections to big ideas are not clear.	Inaccurate. Not connected to big ideas in science.
Information Sources	Multiple sources. Wide range of resource types. Reliable sources. Current sources.	Two or more sources. Two types of resources. Some reliable sources. Some current sources.	One source (often personal knowledge or text only). Narrow range of resources. Unreliable sources. Out of date sources
Conventions	Generally error free in regard to sentence structure, punctuation, capitalization, spelling, and standard usage.	Sentence structure, punctuation, capitalization, spelling, and standard usage errors are noticeable, but do not seriously impair readability.	Errors in sentence structure, punctuation, capitalization, spelling, and standard usage impair readability.

What Was A Brontosaurus?

Most adults were taught in school that the Brontosaurus was one of the largest dinosaurs to ever live. It was a plant-eating animal that lived in swampy areas to find the food it needed. The name Brontosaurus means “Thunder Lizard.”

Today, scientists have learned that the Brontosaurus as a new species of dinosaur never really existed. The mistake was made by O. C. Marsh, a famous paleontologist, who had already found the same type of dinosaur earlier and named it Apatosaurus. Another mistake that was made concerned the skull that was put with the Brontosaurus bones. It actually belonged to another type of dinosaur called Camarasaurus.

The images that appeared in paintings, movies, signs, and postage stamps were all misleading because they showed the wrong head shape for the dinosaur that was called Brontosaurus.

It was also discovered that large dinosaurs like the Apatosaurus did not like muddy, swampy land. Their fossil remains have been found near dry flood plains instead.

That is why very few people talk about a dinosaur named Brontosaurus today.