

# *Digging for* **SUE**

by Susan Evento



# STRATEGIES & SKILLS

## Comprehension

**Strategy:** Summarize

**Skill:** Main Idea and Key Details

## Phonics

Consonant + *le* (*el*, *al*) syllables

## Vocabulary Strategy

Greek and Latin Roots

## Vocabulary

exploration, important, machines, prepare, repair, result, scientific, teamwork

## Content Standards

Science as Inquiry

Word count: 1150\*\*

**Photography Credit:** Cover Image Sources/(bkgd) Datacraft Co Ltd/imagenavi/Getty Images, (inset) Sue Ogrocki/Reuters/CORBIS

\*\*The total word count is based on words in the running text and headings only. Numerals and words in captions, labels, diagrams, charts, and sidebars are not included.



## Education

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## Essential Question

Why is teamwork important?

# *Digging for* **SUE**

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## Chapter 1

# The Mighty T. Rex

Tyrannosaurus rex were huge, fierce animals that walked on two legs. They ruled the Earth about 67 to 70 million years ago. How do we know this?

T. rex bones were first found around 1900. Then, parts of more T. rex **skeletons** were found. Scientific research was done on these **fossils**. In 1990, scientists made an exciting new discovery. It led to more information about these dinosaurs.

*Tyrannosaurus rex* means “king of the tyrant lizards.”





Sue made her discovery right before she and the fossil hunters were about to leave.

In 1990, Sue Hendrickson was part of an exploration for fossils in South Dakota. One day, Sue took a walk with her dog, Gypsy, to some nearby cliffs. Her group had not yet searched there.

Sue found a few small bones on the ground. Then she spotted some huge bones sticking out of the cliff. Sue climbed up closer. She saw backbones and a leg bone. She noticed that the bones were hollow. This meant that they came from a meat-eating dinosaur. She knew T. rex had lived in this part of North America. Sue was excited by her important discovery.

## Chapter 2

# The Dig

Sue and a few other fossil hunters and **paleontologists** started to dig into these sandstone cliffs. They didn't use machines because they didn't want to harm the bones. Instead, Sue and her team used picks and shovels to remove the dirt and rock. After five days of teamwork, they reached the bones buried 30 feet down.



Fossil hunters spend hours inspecting rock for fossils.



Sue's enormous jaw held jagged teeth up to 12 inches long.

Then, Sue and the other fossil hunters had to work more carefully. They used smaller tools, including knives and brushes. They kept finding bones. Some of them were huge. The skull was about five feet long! The hunters found almost all of the bones. Most were in excellent shape. Those that were in danger of cracking were glued. Sue's team was able to dig out all of the bones in just 17 days!

The hunters named this T. rex *Sue*. They named her after the woman who found her. However, scientists still do not know if this T. rex was male or female.

The diggers took photographs and videos as they dug. They numbered the bones and took notes. They traced each bone's actual size on paper. Later, they would be able to put the bones together to form the skeleton. Many of the bones were in the same position they were in millions of years ago when Sue died. Some, however, were mixed up. A few bones were missing.

Fossil hunters sometimes squeeze into tight spaces to unearth bones.



## *Did You Know?*

Sue's bones show several injuries. Her skull bones show a head injury. One leg bone shows signs that it was broken but later healed. Some tailbones were broken too. Sue probably lived a dangerous life and fought with other dinosaurs.



The diggers didn't want to separate Sue's skull from her hip bones at the work **site**. They kept some rock around the bones so they wouldn't be easily broken. Very carefully, the diggers removed all of these bones and rocks together in a large chunk.

They covered the fossils with layers of foil and then with cloth soaked in plaster. As the plaster dried, it hardened. It protected the bones the same way a cast protects a person's broken bone.

For a few years, people fought over who had the right to Sue's bones. Finally, Sue's bones found their home. She was brought to the Field Museum in Chicago, Illinois.

Workers numbered the plaster casts to remember where and when the fossils were found.



## Chapter 3

# At the Museum



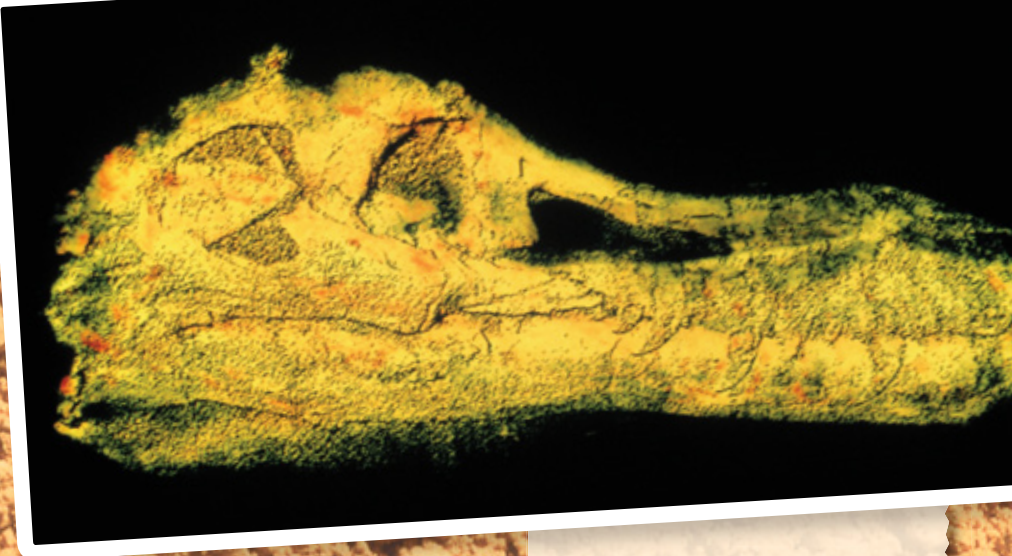
Sue's skull took more than 3,500 hours to clean.

There was still a lot of work needed to prepare Sue's bones for display. More than 250 bones were cleaned and studied.

First, workers removed the foil and the plaster. Then they removed the rock around the bones. At first, they used tiny jackhammers. As they got closer to the bone, they used smaller tools. They even used tools like paintbrushes and toothbrushes. Finally, they used a small sandblaster to remove the tiniest pieces of rock. Once the bones were clean, they were ready for the next step.

The team used a **CT scanner** to take **X-rays** of the inside of the bones. Sue's huge skull wouldn't fit into the scanner. The team shipped it to a place where they scan airplanes for problems. Sue's skull just fit inside!

The museum received nearly 800 scans of Sue's skull. Each scan was like a slice of an X-ray. Each one could be looked at separately. The slices could also be stacked together and viewed in 3-D. Looking at them that way is like taking a tour of Sue's skull!



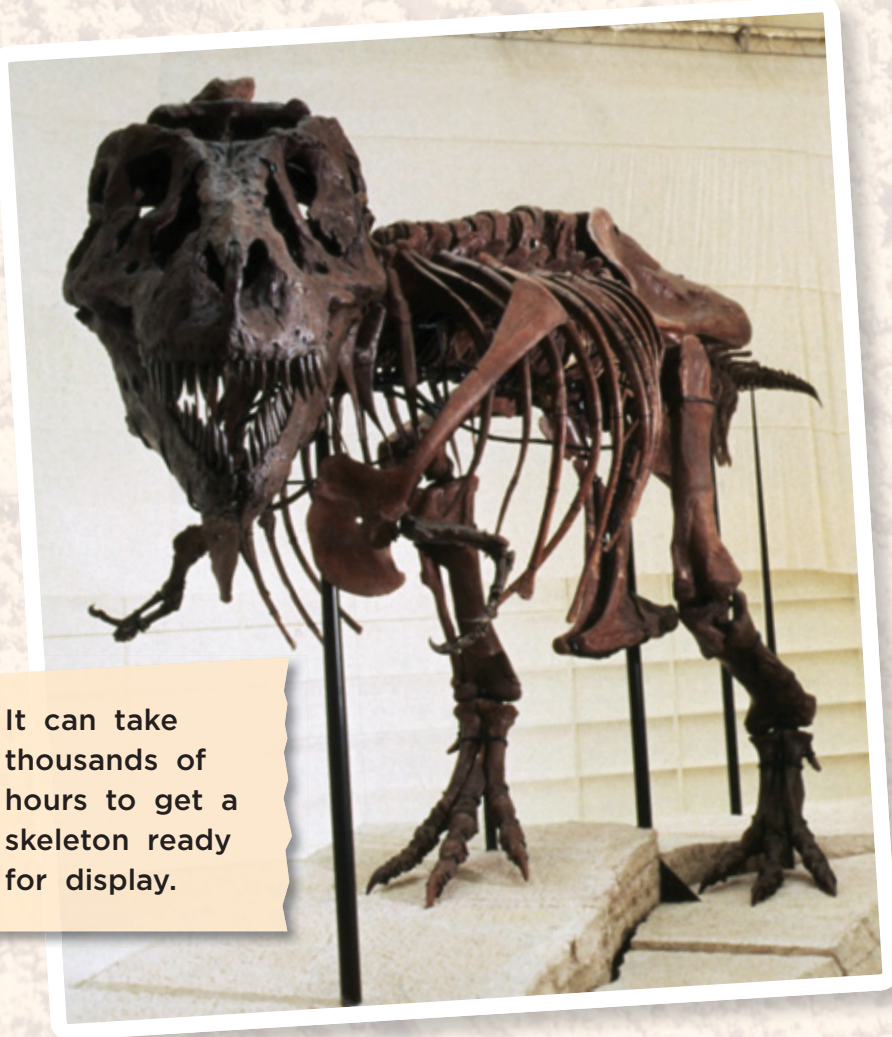
This is an X-ray scan of Sue's giant skull.

Getting a dinosaur skeleton ready for display is a big challenge. First, the team fixed small cracks in the bones with a special glue. They also used a material like modeling clay to repair missing parts of bones. Sue was missing one arm, one foot, and a few backbones. The workers used the bones they had to make models of the missing ones.



Putting together Sue's numbered bones was like doing a giant puzzle.

The workers also made casts of each bone. This way, copies of the whole skeleton could be displayed in other places. Next, the workers had the huge job of putting all the pieces together.



It can take thousands of hours to get a skeleton ready for display.

The workers needed a special steel frame to hold up the bones. Sue's skull was too heavy to be placed on top. They made a lighter plastic cast of it. They placed the real skull in a special case on the floor above where Sue stands. It's as if her own skull is looking down on her!

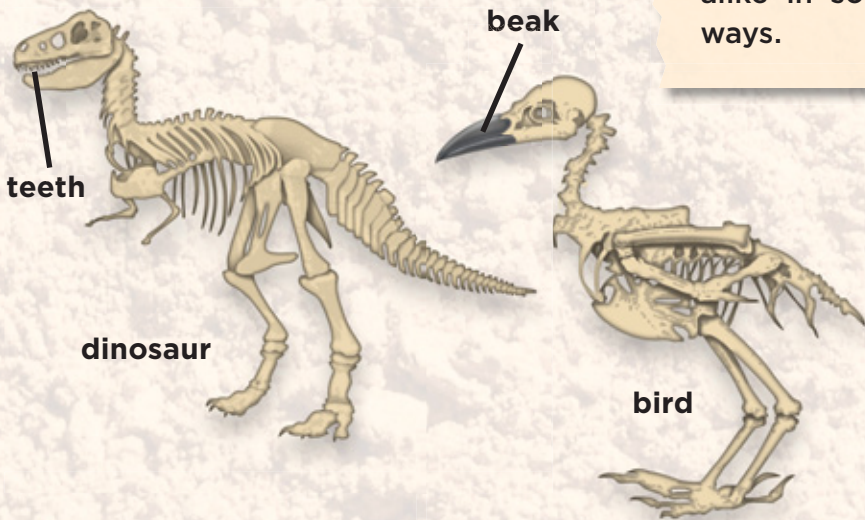


**Sue's skull is too heavy and bulky to lift easily.**

We still don't know why T. rex had such small arms. We do know that they were strong. Scientists can tell this because the huge arm muscles left marks on Sue's arm bones. The scans also show that T. rex had some bones in the same positions as birds. This might mean that today's birds are relatives of T. rex.

What have we learned from Sue? She was about 41 feet long. She stood about 12 feet high from the hip. She weighed about 9 tons. And she died when she was about 28 years old.

**Birds and dinosaurs are alike in some ways.**





**Sue faces visitors at the Field Museum in Chicago.**

Nearly 10 years after her discovery, Sue was finally displayed in the Field Museum. Millions of people have now visited Sue.

Sue is the largest T. rex ever found. Her fossils are also the most complete and in the best shape. We have learned many things as a result of studying Sue.

As scientists uncover new bones, we learn more about dinosaurs. Each new discovery helps us better understand the past and how animals have changed throughout time.

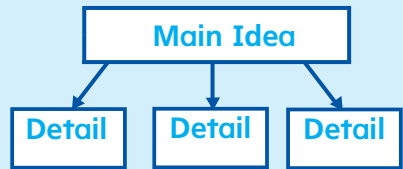
(bkgd) Datacraft Co Ltd/Imagenavi/Getty Images, (inset) Sue Ogrocki/Reuters/CORBIS



# Respond to Reading

## Summarize

Use the Main Idea and Details chart to help you summarize *Digging for Sue*.



## Text Evidence

1. What kind of text is *Digging for Sue*? What text features help you to know this? **GENRE**
2. What is the main idea on page 9? What are some of the key details?  
**MAIN IDEA AND KEY DETAILS**
3. The Greek root *saur* means “lizard.” How does this help you know the meaning of *dinosaur*?  
**GREEK AND LATIN ROOTS**
4. Write about the main idea and key details on pages 13–14. **WRITE ABOUT READING**

## Compare Texts

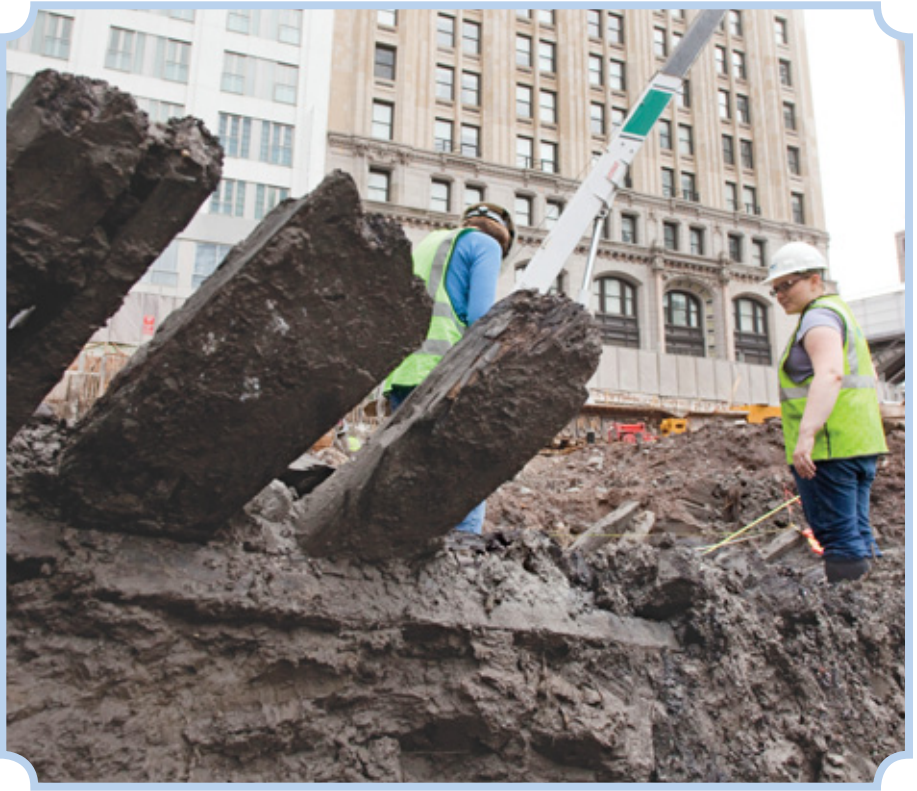
Read about how explorers work as a team.

# *Ancient Ship Discovered!*

In 2010, an amazing discovery was made in New York City. A machine was digging at the site of the new World Trade Center. Suddenly, it struck something hard. It was the wooden body of an ancient ship!



Workers uncovered an ancient ship 20 feet underground in Manhattan.



**Scientists measured and labeled items from the ancient ship.**

Scientists hurried to the site. They needed to dig up the ship as quickly as possible. The air would soon destroy the wood. Many people carried parts of the ship by hand from the site. These parts were sent to a place to be studied.



Scientists studied a coin and a shoe buckle found on the ship.

Scientists studied the rings in the ship's wood to find out when it was built. They think it was built between 1770 and 1780. It probably carried goods for sale. It might have carried them along the Hudson River.

Scientists hope to discover more about this mysterious ship by examining objects found at the site.

Mark Lemmihan/AP Images



## Make Connections

How did teamwork help uncover Sue's fossils? **ESSENTIAL QUESTION**

Name two ways scientists protect objects they find and study. **TEXT TO TEXT**

# Glossary

**CT scanner** (*see-TEE SKAN-er*) a machine that takes X-rays and lets doctors look inside bodies (**page 9**)

**fossils** (*FOSS-uhlz*) the hardened remains of animals or plants that lived long ago (**page 2**)

**paleontologists** (*PAY-le-ahn-TAHL-uh-juhsts*) scientists who study fossil remains (**page 4**)

**site** (*SAHYT*) an exact area or plot of ground (**page 7**)

**skeletons** (*SKEL-i-tuhnz*) frames that support and protect the bodies of animals (**page 2**)

**X-rays** (*EKS-rayz*) pictures taken of the inside of bodies (**page 9**)

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X-rays, 9

# Focus on Science

**Purpose** To find out how teamwork helps you explore

## What to Do

**Step 1** Think about a time when you worked with a team to explore something.

**Step 2** Create a chart like this one.

| Team Member | Role | How Member Helped |
|-------------|------|-------------------|
|             |      |                   |
|             |      |                   |
|             |      |                   |

**Conclusion** Share your chart with the class. Talk about what you explored and how working as a team made your job easier. Describe how each team member helped. Discuss what you learned.

# Thinkmark

## Text Structure

How does the author organize information in *Digging for Sue*?

What is the purpose of the captions found next to each photograph?

## Vocabulary

What are the key words in this text that relate to the topic?

What new words did you learn after reading *Digging for Sue*?

## Conclusions

What conclusions can you draw about Sue's discovery?

What can we learn when we dig up things from the past?