

# Mary Anning: Fossil Hunter

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Year 6



## Overview

This report tells the story of Mary Anning, who was born in 1799. Her lifelong interest in hunting for “curios” led to some important finds that caught the attention of scientists from around the world. The article recounts Mary’s early life and how the skills her father taught her helped Mary to support the family after his death. Mary’s discoveries have helped scientists to understand the evolution of life forms.

The article also highlights changes in the opportunities available to girls and women: Mary’s lack of education and the absence of women as scientists in her day are in marked contrast to the situation now.

The theme of change over time can be explored through the physical changes in living things and through the social changes in human history.

Texts related by theme

“The Dinosaur Hunter” SJ L3 Sept 2012 | “The Biggest Snake in History” SJ L3 Sept 2011 | “On the Dinosaur Trail” SJ 4.1.11

## Text characteristics from the year 6 reading standard

mixed text types (for example, a complex explanation may be included as part of a report)

sentences that vary in length and in structure (for example, sentences that begin in different ways and different kinds of complex sentences with a number of subordinate clauses)

Mary's father died when she was eleven, and life became much harder. The family had no savings and owed money. One day, a tourist bought a fossil that Mary had just found on the beach. The money was enough to buy bread for a week. This helped Mary realise how important her work was for her family's survival.

### The Crocodile in the Cliff ~

One day, Mary's brother Joseph led her along the cliffs. He said he'd found the skull of a crocodile. Straight away, Mary could see that this was the skull of no ordinary creature. It was huge – over a metre long – and the eye socket was large and round. The children would need help digging the skull out of the cliff. And was it possible the creature's fossilised body was also hidden in the rock?

With the help of two men from the village, the rock was slowly dug away. Along with the skull, there were several vertebrae. This made Mary certain that the creature's body was also there.

Although she was only twelve years old, Mary was right. It took many months to unearth the whole skeleton, which was cleaned and sold. It was eventually put on display in the British Museum. People called it a "fish-lizard". Later, it was given the name **ichthyosaur**. It was the first fossil of its kind to be discovered.

### New Ideas ~

In the early 1800s, little was known about life on Earth and how it had developed. Most people didn't believe that some of the oldest fossils were the remains of extinct creatures. Extinction was a new idea.

Scientists and thinkers tried to come up with explanations for fossils like the fish-lizard. But as the ancient cliffs at Lyme Regis continued to crumble, more strange creatures were found. What were they, and what did they mean? Mary's discoveries led to much debate.

Of course, Mary didn't take part in these discussions. At the time, nearly all scientists were men. Girls weren't encouraged to study or have a career at all. This made it very difficult for a young woman who was interested in science. And a young woman with practically no education and from a poor family had even less chance of being heard.

▲ The first scientific drawing of an ichthyosaur, 1814

▼ The ichthyosaur fossil found by Joseph and Mary Anning

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ICHTHYOSAURUS PLATYODON. Geoff. Described by Owen in *Transactions of the Geological Society of London*, vol. 1, p. 15, 1830. (See also p. 15, 1830.)

LOWER LIAS. LYME REGIS.

illustrations, photographs, text boxes, diagrams, maps, charts, and graphs that clarify or extend the text and may require some interpretation

a significant amount of vocabulary that is unfamiliar to the students (including academic and content-specific words and phrases), which is generally explained in the text by words or illustrations

some ideas and information that are conveyed indirectly and require students to infer by drawing on several related pieces of information in the text

Reading standard: by the end of year 6

## Possible curriculum contexts

### SCIENCE (Living World)

LEVEL 3 – Evolution: Explore how the groups of living things we have in the world have changed over long periods ...

### ENGLISH (Reading)

LEVEL 3 – Structure: Show a developing understanding of text structures.

### ENGLISH (Writing)

LEVEL 3 – Structure: Organise texts, using a range of appropriate structures.

### Possible reading purposes

- To find out who Mary Anning was and why she became famous
- To learn about how some scientific discoveries are made
- To explore the way fossils can help us understand changes in living things over very long periods of time
- To explore changes that have occurred in the lives of girls and women over time.

### Possible writing purposes

- To research and write about another early scientist
- To research and write about the evolution of another life form
- To create a timeline of important milestones in another area of science (or of social change).

See [Instructional focus – Reading](#) for illustrations of some of these reading purposes.

See [Instructional focus – Writing](#) for illustrations of some of these writing purposes.

## Text and language challenges

### VOCABULARY:

- Possible unfamiliar words and phrases, including “struck by lightning”, “tongue-twister”, “miracle”, “gossiped”, “curios”, “eye socket”, “vertebrae”, “unearth”, “eventually”, “extinct”, “extinction”, “thinkers”, “practically no education”, “auction”, “curators”, “find” (noun), “suspicious”, “reputation”, “disbelief”, “took the credit”, “theory of evolution”, “squaloraja”
- The scientific terms and names, some of which are explained in the text or in the glossary
- The figurative language, “sharp eyesight”, “a good eye”, “piecing ... together”, “fame grew”.

### Possible supporting strategies

If the students have studied animal fossils before, review the specialised vocabulary they already know. Students could work in pairs to brainstorm what they know about fossils. The pairs could share their vocabulary and ideas, starting a chart or dictionary or web resource. During this discussion, introduce and explain new key vocabulary for this text, using audio and visual materials to support your explanations. Students could then add new words as they find them in the text. This could become a class resource, with illustrations, approximate dates, and other information added by the students.

Explore the root words and derivations of the scientific terms, for example, the “-ologist” ending and the various “-saur” names.

*The English Language Learning Progressions: Introduction*, pages 39–46, has some useful information about learning vocabulary

### SPECIFIC KNOWLEDGE REQUIRED:

- Knowledge of fossils and how they have helped scientists understand evolution
- Knowledge of some kinds of prehistoric creatures
- An understanding that life forms have changed over very long time periods
- Some understanding of time periods
- Knowledge that social changes have occurred over time, for example, changes in access to education and the distribution of resources.

### Possible supporting strategies

If possible, show students any fossils the school may have or visit a local museum to see fossils. There may even be some in your local environment. Some students may have fossils at home they could bring in.

Review what students already know about fossils, including their age, what they represent, and why they are important to scientists.

Review what students know about the changes that have occurred in life forms over very long periods of time and elicit the concept of evolution.

During reading, encourage the students to make comparisons between Mary’s life and their own. After reading, they could chart the differences and reflect on the social “evolution” that has occurred.

### TEXT FEATURES AND STRUCTURE:

- Report with headings, labelled illustrations, and photographs
- A glossary
- A timeline
- The use of questions within the text
- Language features such as a tongue-twister, idioms (“stand up to”, “never spoke”), and questions used to evoke the thinking of the day (“What were they, and what did they mean?”)
- Time and sequencing language: “From the moment”, “in 1799”, “later”, “then”, “when she was eleven”, “just”, “One day”, “Straight away”
- A wide range of mostly past verb forms: “grew up”, “he’d found”, “could see”, “would need”, “had developed”, “had been struggling”
- Many passive constructions: “was struck”, “was slowly dug”, “was cleaned and sold”, “became known”.

### Possible supporting strategies

If necessary, support the students to identify the structure of the text, skimming the article with them. Prompt them to examine the photographs and the captions as well as the text. Co-construct, add to, or refer to a chart showing features of an effective report. Find examples of the features and discuss the purpose and effectiveness of each one.

For students who will find this text challenging, discuss and preview the language, structure, and content orally before reading. One way to do this is to brainstorm what students expect to read under the subheadings. You could do this after reading pages 8 and 9 together. Have students work in pairs or small groups to make notes under the headings, then share and discuss everyone’s ideas. Use this discussion as a chance to feed in key vocabulary and concepts. Record the students’ predictions. Students who share a first language other than English could explore the text structure and content in their first language.

# Instructional focus – Reading

**Science** (Living World, level 3 – Evolution: Explore how the groups of living things we have in the world have changed over long periods ...)

**English** (Level 3 – Structure: Show a developing understanding of text structures.)

## Text excerpts from “Mary Anning: Fossil Hunter”

## Students (what they might do)

## Teacher (possible deliberate acts of teaching)

From the moment she was struck by lightning, Mary Anning’s life was extraordinary. Born in 1799, Mary grew up in Lyme Regis on England’s south coast, an area known for its unusual fossils and shells. Because her family was poor, Mary collected these fossils and shells to sell. Some people think she’s the person in the tongue-twister “She sells seashells by the seashore.”

*Students slow their reading to absorb the large amount of information. They make connections between the text and things they know about, such as the expression “struck by lightning”, the setting in time and place, the need for a family to earn extra money, and tongue-twisters. They ask questions of the text and search for answers, for example, about the reference to lightning and why her life was extraordinary and why people bought seashells. They use information in the text and their connections and questions to infer that Mary must have been very unusual and that collecting fossils would somehow make her life extraordinary.*

Scientists and thinkers tried to come up with explanations for fossils like the fish-lizard. But as the ancient cliffs at Lyme Regis continued to crumble, more strange creatures were found. What were they, and what did they mean? Mary’s discoveries led to much debate.

*Students integrate information from this paragraph and the previous one to infer that the concept of extinction was difficult for people to understand.*

*They use their knowledge of literary devices to recognise that the questions that the author is posing are rhetorical: they are the kinds of questions people of Mary’s day were asking. They make connections between the questions and their own knowledge to infer that scientists eventually used new discoveries and theories as they worked out what fossils were.*

### Fantastic or Fake?

In 1824, Mary made another amazing discovery: a plesiosaur fossil in the cliffs near Lyme Regis. ... At first, people said Mary’s find was a fake. Surely no animal could have had such a long, thin neck and tiny head! Mary was accused of piecing the skeletons of two different animals together.

*Students integrate information from this discovery and Mary’s other finds, asking questions as they form opinions about her reliability. They add evidence from what they already know about prehistoric creatures to infer that the find was genuine. They make connections between the text and their own experiences of fakes, for example, retouched or altered photographs, to infer that the scientists were justified in questioning the find.*

**PROMPT** the students to read carefully.

- There is a lot of dense information in this article. Think about the strategies you can use to help you understand the text, such as asking questions, making connections with things you already know, and rereading.

Ask the students to pose questions, like the ones below, to identify the key ideas.

- When was Mary born?
- What do you know about this time period?
- Where did Mary grow up?
- What was the area that Mary grew up in famous for?
- What did Mary do with the fossils she collected?
- Why did Mary collect fossils?

**ASK QUESTIONS** to support the student’s inferences.

- The expression “struck by lightning” is often used as a metaphor. How do you think it is used here? Why do you think that?
- Using the title, the images, and the setting, what can you infer about Mary?

**DIRECT** the group to split in half and ask one half to take the role of scientists in Mary’s day. The other half will take the role of modern scientists. Ask the groups to take turns to explain the meaning of the fossils.

- What information and knowledge was missing in Mary’s day?
- How might scientists have learnt more about the meaning of fossils?
- What does this tell you about the importance of Mary’s discoveries?

**MODEL** forming an opinion and using evidence.

- When I read about this find and looked at the illustrations, they reminded me of prehistoric animals I’ve seen in books and movies like *Jurassic Park*. So in my opinion, Mary’s find was genuine. I’ve also learnt from this article that Mary was a very curious and hard-working person. I know you can fake photos on a computer, but I’m thinking her find was a genuine fossil.
- What do you think?
- What evidence did you use?
- Were the scientists right to doubt her? Why do you think that?

A speaking frame (and some preparation time) could help English language learners participate in discussions like this.

- I think it was genuine/not genuine because \_\_\_\_\_
- I think the scientists were right/wrong because \_\_\_\_\_

Note that many ELLs would also need support to construct clauses giving their reasons. But the frame gives them a start. They would need time and support to prepare their responses.

**GIVE FEEDBACK**

- You changed your opinion of Georges Cuvier when you learnt more about him. It’s important to use evidence to support or change our opinions.
- The connections you’ve made between your life and Mary’s helped you understand why people didn’t believe her at first.
- You’ve used your knowledge of prefixes to work out the first part of the word. Now think back to what we learnt about that suffix to work out what the whole word means.

## METACOGNITION

- How did you infer that scientists have learnt a lot about evolution since Mary’s day? What parts of the text helped you?
- Talk with a partner about how you knew what the words “a good eye” meant. How did you know that? What helped you?
- Find the information in the text that helped you to form an opinion about the kind of person Mary was. How did your knowledge of people and their behaviour help you?
- Explain to your partner how you integrated information to make inferences about Mary’s reliability.

Reading standard: by the end of year 6

The Literacy Learning Progressions

Assessment Resource Banks



# Instructional focus – Writing

**Science** (Living World, level 3 – Evolution: Explore how the groups of living things we have in the world have changed over long periods ...)

**English** (Level 3 – Structure: Organise texts, using a range of appropriate structures.)

## Text excerpts from “Mary Anning: Fossil Hunter”

## Examples of text characteristics

## Teacher (possible deliberate acts of teaching)

In the early 1800s, little was known about life on Earth and how it had developed. Most people didn't believe that some of the oldest fossils were the remains of extinct creatures. Extinction was a new idea.

### HISTORICAL CONTEXT

*Writers help their readers understand the context of times long ago. Providing information can help readers understand why people thought differently in the past.*

**ASK QUESTIONS** to help the students draft or edit their writing.

- What time period are you writing about?
- What big differences will your readers need to understand?
- What information can you add to help your readers make connections with your writing?

### RESEARCH

*Careful research can provide accurate information and give an article credibility. Including well-known facts can help readers make connections with people or events. Sources of information can include books and articles, websites, and encyclopaedias.*

**ASK QUESTIONS** to support the students' research.

- What information will help your readers to understand the context or how people or events were connected?
- How will you decide whether the information is reliable?
- How will you organise your information?

For a time, it seemed that Mary's reputation was ruined. How could she stand up to such disbelief? And how would her family survive if she could no longer sell her fossils?

### QUESTIONS

*Writers can add questions to help their readers think about the implications of an event. This is a clever way to have the readers infer meaning.*

**MODEL** the way a writer can support readers to make inferences.

- In this extract, the writer wanted us to understand how terrible it would be if people thought Mary's discoveries were fakes. Instead of telling us directly, the writer makes us work it out for ourselves by asking questions. As we think about the answers, we make inferences.
- As you reveal the events in the text you are writing, what do you want your readers to understand? Would this strategy work for you?

1799 Mary Anning is born.

1804 Georges Cuvier suggests that some fossils are thousands of centuries old, which is much older than people had thought.

1809 Charles Darwin is born.

### TIMELINE

*A timeline helps readers to understand a sequence of events and can show how they are related. A timeline shows a person's life in the wider context of the times in which she or he lived.*

*Timelines often have present verb forms even though they are talking about the past.*

**DIRECT** the students to share their work with a partner. Have them focus on the events in their writing and how they relate to the person or main event.



- Would a timeline help your readers understand the order of events?
- Are the relationships between events and people clear?
- How could you make changes or add information to help your readers?

### METACOGNITION

- Why did you use this particular structure to organise your information? How did reading this article help you to make this decision?
- Find a part in your writing where you added or deleted information and explain to your partner why you did this.
- How has working with a partner to give and receive feedback helped you as a writer? What (if anything) could improve the feedback process?

### GIVE FEEDBACK

- The details you've added helped me believe this is true. I can tell that you used good sources of information.
- Your revisions have made your writing much more effective. Using questions is a great strategy to help your readers to infer meaning.
- The mixture of information on your timeline really allows me to understand what else was happening when ... lived.

 **Writing standard: by the end of year 6**  
 **The Literacy Learning Progressions**