Mary Anning

The Girl Who Dug Up Dragons

Author: Nick Quark · Recommended age: 7–12 · 10 chapters

Name: _____ Date: _____

1. Before you read

1. Have you ever found a stone with a strange shape, a shell, or a print in a rock? Where was it, and what did you think it was?
2. The title talks about "dragons." What kind of dragons could a girl dig up on a beach?
3. Imagine you discover something important and someone else tells it as if it were theirs. How would you feel? Write it down and read it again when you finish the book.

2. Comprehension questions

*Keep the book in front of you: look things up, reread, and answer in your own words. The labels tell you what kind of question it is: **fact** (it's written in the book), **why** (you have to explain a cause), and **opinion** (there's no single right answer).*

Chapters 1 and 2 · The lightning and the snake stones

1. What happened on August 19, 1800, and what did people do to get baby Mary breathing again? FACT
2. Why is sheltering under a tree the worst thing you can do in a storm? WHY
3. People in Lyme called some stones "snake stones" and others "devil's fingers." What do we call them today? FACT
4. Why was Lyme Regis full of wealthy tourists in those years? WHY

Chapter 3 · The Monster on the Beach

5. Who found the monster's head, who found the body, and how much time passed in between? FACT
6. Why did cliff landslides, which were so dangerous, help people find fossils? WHY
7. The scientific papers about the ichthyosaur didn't mention Mary or Joseph. Do you think that was fair? Why? OPINION

Chapters 4 and 5 · The rules of the cliff and the auction

8. According to the story, what did Tray do when Mary found a fossil too big to dig out alone? FACT
9. Mary couldn't afford science books. What two things did she do to learn? FACT
10. What did Thomas Birch do to help the Annings, and how much money did it raise? FACT

Chapter 6 · The Impossible Animal

11. Why did Georges Cuvier suspect that Mary's plesiosaur was a fake? WHY
12. Why wasn't Mary at the London meeting where her skeleton was presented? WHY

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13. Cuvier admitted he had been wrong. Is it hard for you to admit a mistake? Why do you think it matters so much in science? OPINION

Chapters 7 and 8 · Poop stones and a dragon with wings

14. What were the "bezoar stones" really, and what clues helped Mary figure it out? WHY

15. What was special about the flying reptile Mary found in December 1828? FACT

16. What did Louis Agassiz do to honor Mary that the English scientists hadn't done? FACT

Chapters 9 and 10 · Tray, the farewell, and the end

17. How did Tray die, and in what year? FACT

18. Evie Swire was eleven when she started the campaign for Mary's statue. Who from your town or city would you make a statue of, and why? OPINION

3. Timeline

Every date comes from the book. There are three blanks, marked ✎: find the year and write it in.

1799	Mary Anning is born in Lyme Regis on May 21.
1800	At fifteen months she survives a lightning strike on an elm tree.
✎ _____	In November her father, Richard, dies and leaves the family deep in debt.
1812	At twelve or thirteen, Mary finds the body of the ichthyosaur whose head Joseph had found.
1820	Thomas Birch auctions his collection in London to help the Annings.
✎ _____	In December she finds the first complete plesiosaur skeleton.
1826	She buys a house in the middle of town and opens her shop, *Anning's Fossil Depot*.
1828	In December she finds the *Dimorphodon*, England's first flying reptile.
✎ _____	A cliff fall kills her dog Tray, right at Mary's feet.
1847	She dies at her home in Lyme Regis on March 9.

4. Science vocabulary

Fossil
The remains or print of an ancient living thing preserved in rock. Minerals slowly fill the bone until it becomes stone in exactly the same shape.

Ammonite
The "snake stones": relatives of squid that lived inside a shell coiled in a spiral.

Ichthyosaur
The "fish lizard": a sea reptile with a dolphin's snout, a crocodile's teeth, and huge eyes. It breathed air and gave birth to live babies in the water.

Plesiosaur
The "near lizard": a sea reptile with a wide body, four oar-like flippers, and a very long neck, described as "a snake threaded through the shell of a turtle."

Pterosaur
A flying reptile from the age of the dinosaurs, with wings of skin held up by one very long finger. It wasn't a dinosaur.

Coprolite
Fossilized poop. The name means "dung stone," and it tells us what ancient animals ate.

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Comparative anatomy
Studying the bodies of different animals and comparing them, as Mary did when she cut open fish and cuttlefish to understand her fossils.

Extinction
When a species disappears from the Earth forever. In Mary's day, hardly anyone believed it could happen.

5. Try it at home: your own fossil print

Many fossils form like this: an animal leaves its print in the mud, disappears, and over time minerals fill the hollow in the same shape. You're going to do the same thing on a small scale, in a couple of days instead of millions of years.

You need

- A lump of modeling clay.
- A shell, a leaf, or a small toy.
- A plastic cup cut in half (ask a grown-up to cut it) or a small container.
- For the filling: flour, salt, and water, mixed into a thick dough.

Steps

1. Press the clay into the bottom of the cup until it's flat and smooth.
2. Push the shell or leaf into the clay and lift it out carefully. Its print stays behind: paleontologists call this a **mold**.
3. Fill the print with the flour, salt, and water dough, pressing it in well so it gets into every hollow.
4. Let it dry for at least a day, then separate the dough from the clay.

What to look for

The dry dough is a raised copy of your object, with its lines and curves. Can you see every detail? Which print comes out better, the shell or the leaf?

What it has to do with the story

It's step 4 of "How Does an Animal Turn into Stone?" in Chapter 3: stone takes the place of bone. When Mary split a rock at Lyme and a coiled shell appeared, she was seeing the same thing you are, but made by nature two hundred million years ago.

Safety: have a grown-up cut the cup. The dough is not for eating.

6. Talk or write about it

Class discussion

Mary found, dug out, and prepared the fossils; the gentlemen in London studied them and signed the papers. Whose discovery is it: the person who finds the piece, or the person who studies and explains it? Find arguments for both sides.

Writing (half a page)

Write the letter Mary might have sent her friend Elizabeth Philpot on the day she learned that the great Cuvier suspected her plesiosaur was a fake.

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Answers for grown-ups

*The **opinion** questions (7, 13, and 18) have no set answer: any well-reasoned response is fine. For the **why** questions we give the explanation the book offers, as a guide.*

Comprehension questions

1. During a horse show a storm broke; the neighbor holding Mary, Elizabeth Haskings, sheltered with two other women under an elm, and lightning struck the tree. All three women were killed. The baby was put in a tub of hot water and began to breathe.
2. Because a tall tree standing alone in the middle of a field is exactly what lightning looks for.
3. Ammonites (the "snake stones") and belemnites (the "devil's fingers").
4. Because Britain was at war with France, so wealthy English people couldn't vacation on the continent and went to their own coast instead.
5. Joseph found the head in 1811; Mary found the body in 1812, about a year later.
6. Because when a chunk of cliff breaks off, the rock uncovers things that had been hidden for millions of years.
7. *Opinion: no set answer.*
8. The story goes that he sat beside the find and guarded it, so nobody would take it and so Mary would know where it was when she came back with help.
9. She copied scientists' papers out by hand, drawings and all, and she dissected fish and cuttlefish from the harbor to compare them with the fossils.
10. In 1820 he auctioned his own fossil collection in London for the Annings' benefit. It raised about 400 pounds.
11. Because, he said, no animal could have a neck like that, with so many vertebrae: he suggested someone had stuck the head of one animal onto the body of another.
12. Because the Geological Society did not admit women.
13. *Opinion: no set answer.*
14. Fossilized poop. They turned up inside ichthyosaur skeletons, where the belly would have been, and when broken open they held fish scales and bits of small bones. Buckland named them coprolites.
15. It was a pterosaur, a flying reptile (today called *Dimorphodon*): the first ever found outside Germany.
16. He named two species of fossil fish after Mary; one of them is *Acrodus anningiae*.
17. A huge mass of rock and earth broke off the cliff and fell on him while he was working with Mary, in 1833.
18. *Opinion: no set answer.*

Timeline blanks

- **1810** — her father, Richard, dies.
- **1823** — the first complete plesiosaur skeleton.
- **1833** — a cliff fall kills Tray.

Before you read and Talk or write about it

No set answers: these are for sparking ideas and conversation.

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