



Scan to try this lesson
in the TBoard app



THE FOSSIL HUNTER OF LYME REGIS

A SKULL IN THE CLIFF

In 1811, Joseph Anning spotted a long, toothy skull weathering out of a cliff at Lyme Regis, a small town on the Dorset coast of England. His sister Mary, then about twelve, returned to the spot and over months of careful digging freed the rest of the SKELETON from the rock. It was an ICHTHYOSAUR, a long-snouted marine reptile that was neither fish nor CROCODILE. The cliffs there are Blue Lias, a banded stack of LIMESTONE and shale laid down under an ancient sea.

SPELL Spell: ICHTHYOSAUR

ICHTHYOSAUR

SPELL Spell: CROCODILE

CROCODILE

KNOWN Over months of careful digging, Mary freed the rest of what from the rock?

SKELETON

KNOWN Those cliffs are a banded stack of shale and what other rock, laid down under an ancient sea?

LIMESTONE

OPEN Mary spent months chipping the skeleton free of the rock. What would be the hardest part of work like that?

Open response - use practitioner judgment

READING THE CLIFF

Anning did not simply dig; she waited for the coast to hand things over. Fossils sat locked in **MATRIX**, the hard rock encasing a **SPECIMEN**, and only the cliff's own destruction released them. Winter **STORMS** battered the cliff face, **LANDSLIDES** dropped whole slabs onto the beach, **WAVES** scoured the fallen debris, and **FROST** split the shale along its **BEDDING**. She learned to read the **STRATA**, the stacked layers of rock each recording a different moment of the old seafloor, and to chisel a specimen free without shattering it.

SPELL Spell: **BEDDING**

BEDDING

SPELL Spell: **SPECIMEN**

SPECIMEN

KNOWN What is the term for the hard rock that encases a fossil and has to be chipped away to free it?

MATRIX

KNOWN What is the term for the stacked layers of rock, each one recording a different moment of the old seafloor?

STRATA

SEMI_OPEN Name two of the forces that broke the cliffs open and exposed the fossils.

NEEDS 2 OF **STORMS / LANDSLIDES / WAVES / FROST**

OPEN When frost splits a slab of shale open on the beach, what would you hope to find inside?

Open response - use practitioner judgment

SCIENCE FORCED TO REVISE ITSELF

What came out of those cliffs kept forcing science to revise itself. In 1823 Anning uncovered a nearly complete **PLESIOSAUR**, a long-necked marine reptile so unlike anything alive that the French anatomist Georges **CUVIER** first suspected a forgery, then conceded it was genuine. In 1828 she found Britain's first **PTEROSAUR**, a flying reptile. She recognized that stony lumps inside **ICHTHYOSAUR** skeletons were fossilized dung - each lump a **COPROLITE** still holding scales and bone. **BELEMNITE** fossils she prepared kept their ink sacs. Animals with no living match made **EXTINCTION** hard to deny.

SPELL Spell: COPROLITE

COPROLITE

SPELL Spell: CUVIER

CUVIER

KNOWN What is the term for a kind of animal dying out completely, with none left alive anywhere?

EXTINCTION

SEMI_OPEN Name two of the ancient animals Anning recovered from the Lias cliffs.

NEEDS 2 OF PLESIOSAUR / PTEROSAUR / ICHTHYOSAUR / BELEMNITE

OPEN Cuvier called the skeleton a forgery and then had to admit it was real. When has something looked impossible to you and turned out true?

Open response - use practitioner judgment

CREDIT WITHHELD

Finding was not the same as being credited. The gentlemen geologists who bought her specimens described them in scientific journals, often without naming her, so the papers that made those animals famous carried other people's names. The GEOLOGICAL Society of London, which several of those men led, would not admit a woman as a member, and did not for decades after her death in 1847. Anning was also poor and a DISSENTER, a Protestant outside the Church of England. A small ANNUITY, a yearly payment arranged by scientific friends, kept her working.

SPELL Spell: DISSENTER

DISSENTER

SPELL Spell: ANNUITY

ANNUITY

KNOWN The London society that studied rocks and fossils refused to admit women. What was its field, as given in its name?

GEOLOGICAL

OPEN They arranged her yearly payment and still left her name off their papers. What is something you would want credit for, even if the money came anyway?

Open response - use practitioner judgment

MATH Mary Anning died in 1847, and the Geological Society of London first admitted women as fellows in 1919. How many years passed between those two dates?

72

THE COAST TODAY

If you go down to the beach below those cliffs today, you are on the JURASSIC Coast, a stretch of English SHORELINE protected for the rock record it exposes, and after a storm loosens the shale you can still pick up an AMMONITE, the coiled shell of an extinct sea animal. The habit of asking who actually found a specimen owes something to her case; museum labels name collectors now. Her fossils sit in major collections, and modern lists of influential British scientists include her, well over a century after she was refused a seat.

SPELL Spell: AMMONITE

AMMONITE

SPELL Spell: SHORELINE

SHORELINE

KNOWN That protected stretch of English coastline, kept safe for the rock record its cliffs expose, is named after which geological period?

JURASSIC

OPEN What would you want to know about the animal that grew an ammonite shell?

Open response - use practitioner judgment

MATH Ammonites swam through the Jurassic Period, which began about 201 million years ago and ended about 145 million years ago. How many millions of years long was that period?

56