

## Mary Anning - Mother of Palaeontology “A woman in a man’s world”

Mary Anning was the first famous female fossil hunter and found spectacular fossils in the cliffs of southern England in the early 1800s. She is called the ‘Mother of Palaeontology’, because of her fossil-finding work. Follow the story below to try ‘thinking like Mary’.

Mary was born on the 27th May 1799 in Lyme Regis in Dorset to a poor working class family. She collected fossils with her father Richard and her brother Joseph, in order to sell them. When her Father died, selling fossils gave the family its only income. Mary never married and worked alone with her dog for company. She went out in rain or sun to see what nature had provided for her on the beach and in the crumbling cliffs of Jurassic rock.



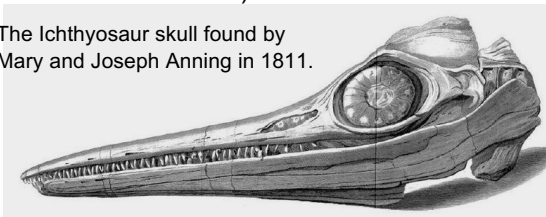
Mary Anning with her dog Tray, with the cliffs and beach of Lyme Regis in the background, 1842.

*Image in the public domain - copyright expired.*

### Thinking like Mary

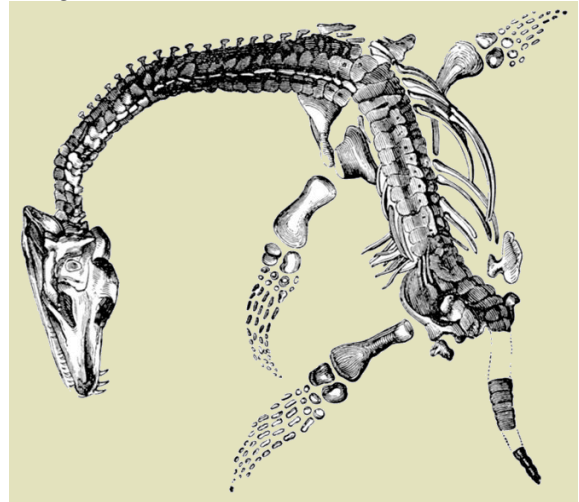
- Why do you think Mary’s discoveries were better after a good storm?
- When Mary and Joseph discovered the skull of an Ichthyosaur – what animal do you think Mary thought it was? (Remember that most people at that time thought that no animals had become extinct, so they assumed it must be the skull of a modern animal).

The Ichthyosaur skull found by Mary and Joseph Anning in 1811.



*This image drawn by Everard Home, published in 1814 is in the public domain because its copyright has expired.*

- Mary found her first Plesiosaur skeleton in 1820 and another more complete one, shown below, in 1830. What do you think Mary thought this animal was? Try drawing a picture showing what it was like when it was alive. What colour might it have been?



The Plesiosaur skeleton found by Mary and Joseph Anning in 1830.

*This image published by William Buckland is in the public domain because its copyright has expired.*

- In 1828 Mary discovered parts of the first pterodactyl ever found in Britain and her brother Joseph drew a picture of it, below. Mary thought this had been a flying reptile. Draw a picture of the way it might have looked when it was flying.



Joseph Anning's sketch of the pterodactyl found by Mary, drawn with belemnite ink

*Image in the public domain - copyright expired.*

- Mary became famous because she was in the right place at the right time and her discoveries of fossil reptiles changed our ideas of the evolution of life. Using the information that you have just read, try completing these lists:

These things helped Mary to become famous	These things were against Mary becoming famous



A portrait of Mary Anning drawn by Henry de la Beche in the 1880s.

*This image is in the public domain because its copyright has expired.*

## The back up

**Title:** Mary Anning - Mother of Palaeontology

**Subtitle:** "A woman in a man's world"

**Topic:** A series of questions to help pupils to think about Mary Anning and her times.

**Age Range of pupils:** 12-18 years

**Time needed to complete activity:** 15 mins

**Pupil learning outcomes:** Pupils can:

- describe/draw how fossils might have looked, when alive;
- explain the historical difficulties of a woman working in a man's world.

### Context

Mary Anning (1799 – 1846) left school at age 11 when her father died but she could read and write, having had a basic primary education. This served her well in later life when she communicated with the 'Great men of Geology', such as William Buckland, George Cuvier and Henry de la Beche. She even taught herself to read French so that she could read Cuvier's work on fossil bones in the original language. She was brought up as a nonconformist but later changed to become a member of the Church of England. The Christian religion was very important in those days and it paid to belong to the state religion. Mary never left Lyme Regis, except once to go to London, but many famous people visited her including the King of Saxony and Jane Austen. She was pleased with this, but was sorry that her work was not widely recognised and acknowledged. None of her museum specimens stated that she was the finder.

Mary Anning was an enigma of her time. At that time few women were scientists and many were just regarded as empty-headed individuals. However her contribution to the development of the understanding of how reptiles contributed to evolution and to the understanding of fossils as extinct life forms was important (George Cuvier in Paris had recently coined the term 'extinct' for animals that no longer existed as living creatures.) At this time the Bible was widely used for interpreting scientific ideas and religion ruled people's lives. Mary's discoveries were made before Darwin published his book '*On the Origin of Species*' in 1859, and her analysis of the bones would certainly have been of interest to Darwin as he developed his theory of evolution.

Mary eventually became famous across Europe as a fossil hunter and was made a Fellow of the Geological Society just before she died – this was very unusual for a woman.

### Thinking like Mary

- *Why do you think Mary's discoveries were better after a good storm?*

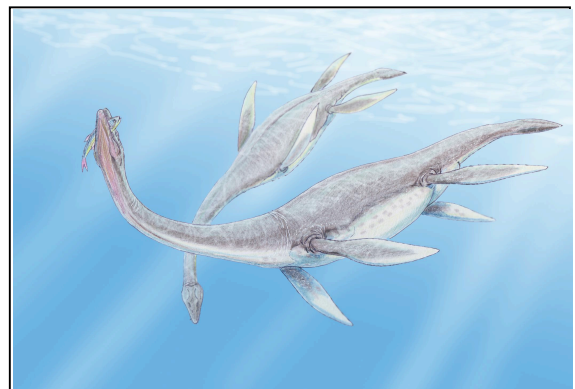
The Dorset coast around Lyme Regis is constantly being eroded because much of it is formed of soft mudstones and crumbly sandstones which the waves constantly pound against. Thus items buried in the cliffs are continually being exposed, fall to the beach and are washed out to sea.

- *When Mary and Joseph discovered the skull of an ichthyosaur – what animal do you think Mary thought it was? (Remember that most people at that time thought that no animals had become extinct, so they assumed it must be the skull of a modern animal)*

Most of the local people probably thought it was a relative of the crocodile, even though its large eyes surrounded by bone were very strange.

- *Mary found her first Plesiosaur skeleton in 1820 and another more complete one in 1830. What do you think Mary thought this animal was? Try drawing a picture showing what it was like when it was alive. What colour might it have been?*

This sea monster with the very long neck would probably have had a grey body, like most other large sea creatures today, and looked like this:



A modern drawing of how Plesiosaurs might have lived in the sea.

*Permission is granted by Dmitry Bogdanov to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.2.*

- *In 1828 Mary discovered parts of the first pterodactyl ever found in Britain and her*

brother Joseph drew a picture of it. Mary thought this had been a flying reptile. Draw a picture of the way it might have looked when it was flying.

Flying pterodactyls may have looked like this:



A modern digital image of how a pterodactyl might have flown.

Permission is granted by Nobu Tamura to copy, distribute and/or modify this image under the terms of the GNU Free Documentation License, Version

- Mary became famous because she was in the right place at the right time and her discoveries of fossil reptiles changed our ideas of the evolution of life. Try completing these lists:

#### These things helped Mary to become famous

- She was encouraged by her family to collect fossils
- She found lots of fossils
- Many of the fossils she found could be sold to give an income to the family
- Some of the skeletons of fossil reptiles she found were nearly complete
- Some of the fossil reptiles were new to science
- They showed that species became extinct
- They gave clues to the evolution of animal life
- She could read and write
- She was in contact with several famous geologists
- She lived in a location that was becoming a seaside resort and visited by many people
- People liked collecting and purchasing fossils for their own enjoyment

#### These things were against Mary becoming famous

**Earthlearningidea team.** The Earthlearningidea team seeks to produce a teaching idea regularly, at minimal cost, with minimal resources, for teacher educators and teachers of Earth science through school-level geography or science, with an online discussion around every idea in order to develop a global support network. 'Earthlearningidea' has little funding and is produced largely by voluntary effort.

Copyright is waived for original material contained in this activity if it is required for use within the laboratory or classroom.

Copyright material contained herein from other publishers rests with them. Any organisation wishing to use this material should contact the Earthlearningidea team.

Every effort has been made to locate and contact copyright holders of materials included in this activity in order to obtain their permission. Please contact us if, however, you believe your copyright is being infringed: we welcome any information that will help us to update our records.

If you have any difficulty with the readability of these documents, please contact the Earthlearningidea team for further help.

Contact the Earthlearningidea team at: [info@earthlearningidea.com](mailto:info@earthlearningidea.com)

- She was a woman at a time when it was thought that women couldn't become 'proper' scientists
- She had no male family members who were scientists
- She was from a very poor working class background
- She was unmarried, at a time when this was a disadvantage
- She lived and worked well away from any big cities like London, where scientific discoveries were discussed
- She didn't know how new scientific discoveries should be reported in scientific papers
- Originally she was not in the established church

#### Following up activity:

Try the Earthlearningidea activity 'Fossil or not?: discussion about what is a fossil and what is not'. Look at the social history of the time to find out how women were treated in the early 19<sup>th</sup> Century.

#### Underlying Principles:

- Evidence from fossils can be used to reconstruct pictures of their past life styles.
- Social history can play an important part in scientific development and advancement.
- Gender has been a critical factor in scientific discovery, and may still be so today.

#### Thinking skill development:

'Thinking like Mary Anning' involves bridging between the current ideas of the pupils and the ways in which geologists may have thought in the past. By its nature, such a process also involves construction, cognitive conflict and metacognition.

#### Resource list:

- an imaginative mind
- paper and pencils, including coloured pencils

#### Useful links:

You can find more about Mary Anning, how her thinking developed, and how important this was in the development of geology, by typing "Mary Anning" into an internet search engine.

#### Source:

Developed by Cynthia Burek for the Earthlearningidea team.

\* Note that the first recorded woman geologist was Etheldred Benett who worked in Wiltshire – but did not become as famous as Mary Anning.