

How to Model Question Writing in Science



Students, I will read this passage about fossils and stop at three different points to write a specific question that can be answered, word-for-word, with information from the text. My questions should be about something important. Based on how this passage is organized, I'll write one question after the section called "Why study fossils," another one after "Sea fossils," and again at the end of the passage. Watch how I do this.

Examples of Specific Questions

Student(s): Mrs. Fielder

Class and Period: Science, Third Period Name of Text: Clues to Ancient Life

Question	Answer	Text Evidence
What do fossils tell us about plants and animals?	Fossils tell us the animals and plants that lived and died at different times.	Page 1, paragraph 2
Where are most body fossils found?	Most body fossils are found buried in sediment, or layers of rock and soil.	Page 1, paragraph 3
Why are fossils not found in igneous rocks?	Fossils are not found in igneous rocks because igneous rocks are made from lava, and the lava's heat would destroy the remains of any animals or plants.	Page 2, paragraph 5

Students can use extra blanks on the learning log to write questions generated by other students and then answer those questions using the text.



In the "Why study fossils" section, one important idea was what fossils tell us. So I "flipped" that fact into a question and answered it.



The next section I read was about different types of fossils—body fossils, trace fossils, and sea fossils. One thing that seems important is the sentence about where most body fossils are buried. I flipped that fact into a question and then answered it.



The last section I read was about how fossils form in the different types of rocks. I learned that fossils never form in igneous rock. So I flipped that fact from page 2, paragraph 5 into a question.

Examples of Wide Questions

Question	Answer	Text Evidence
How do fossils provide a record of life on Earth?	Fossils provide a record of life on Earth by telling us what plants and animals lived, when they died, and how major events, like climate change and meteorite impacts, affected life.	Page 1, paragraph 2
Why is it difficult to find fossils in igneous and metamorphic rocks?	It is difficult to find fossils in igneous rocks because they are made of magma, and the lava would have burned up any plants and animals. Fossils are difficult to find in metamorphic rocks because they are made from pressure and heat, and the pressure would have destroyed the evidence of fossils.	Page 2, paragraphs 5 and 6
If you wanted to find a fossil, would you look near a river or near a volcano? Why?	To find a fossil, you would look near a river because that is where sedimentary rocks are found, and fossils are usually found in sedimentary rocks. You cannot find fossils near volcanoes because the lava would have burned away the plants and animals in igneous rocks.	Page 2, paragraphs 3 and 5



The very first sentence in paragraph 1 tells why fossils are so important, but it doesn't say how fossils provide a record of life on Earth. I changed that sentence into a wide question, and to answer it, I had to look in the next paragraph and put together the ideas from two places in the text.



The important fact I learned on page 2 was that most fossils are found in sedimentary rocks. I wondered why we don't usually find fossils in the two other types of rocks. This is a wide question because you have to take information from multiple places in the text to answer it.



My last wide question is one that can be answered by making an inference (combining what I already know with information from the text). To answer this question, you have to infer that sedimentary rocks are found near rivers.

Name: _____ Class: _____

Clues to Ancient Life

By Rona Arato
2004

Fossils are the remains or impressions of organisms from long ago. In this informational text, Rona Arato discusses how different types of fossils are formed and why it's important to study them. As you read, take notes on the different types of fossils, how they're formed, and why they are important.

- [1] Fossils provide a record of life on Earth. Fossils reveal evidence of ancient life that is preserved in sediment or sedimentary rock. Fossils range from tiny plants and animals to the bones of enormous dinosaurs.



"Camarasaurus" by daveynin is licensed under CC BY 2.0.

Why study fossils?

Scientists learn about past life on Earth and how Earth has changed over millions of years from fossils. Fossils tell what animals and plants lived and died out at different times. By examining fossils and the rocks they are found in, scientists understand the effects that events such as mass extinctions,¹ meteorite² impacts, and climate change have on Earth's history. Fossils provide a valuable look into our past, but they do not tell the whole story. Many plants and animals did not become fossils.

STOP AND WRITE A QUESTION

Body Fossils

Body fossils are the whole body or parts of the body of a plant or animal. To become a body fossil, some part of the organism must not decay or rot. Skin and internal organs rot, but bones do not. Plant material rots, so plants occur only as imprint fossils. Most body fossils are found buried in sediment, or layers of rock and soil. In rare cases, extreme cold freezes an organism, similar to the way a freezer preserves food. In very dry conditions, such as deserts, a dead animal loses its moisture and shrivels up.

Trace fossils

Trace fossils are markings left behind by an organism such as footprints, trails, burrows, and nests. Scientists learn about the movement and behavior of animals from trace fossils. Coprolites are fossilized animal waste. Paleontologists³ learn what an animal ate from its coprolite.

1. **Extinction (noun):** the state or process of an entire species dying out
2. a mass of stone or metal that has reached the earth from outer space
3. a scientist who studies fossils

Sea fossils

- [5] Over 2,000 years ago, Greek scientists found fossils of sea life in the Pindus Mountain range, in Greece. They said the fossils proved that the mountains had at one time been under the sea. Most people refused to believe them. Today, scientists know that oceans at one time covered most of Earth then receded,⁴ leaving behind dry land. Life began in the sea and has existed about eight times longer than life on land. Many more sea animals than land animals have been preserved.

STOP AND WRITE A QUESTION

How fossils form

Earth's crust is made up of different types of rock. Fossils are found in rock. There are three forms of rock: igneous, sedimentary, and metamorphic. Rocks are made up of different kinds of minerals. Minerals are solid, non-living substances made of elements.

Sedimentary rock

Most fossils are found in sedimentary rock. The word sediment means "something that settles." Sedimentary rocks are a mixture of dust, sand, mud, shells, corals, and other materials that settle underwater or on land, and compress under pressure. Sedimentary rock forms in layers called strata, with the oldest layer under the newer layers. When a plant or animal dies, it is covered by layers of sediment and preserved as a fossil. Many sedimentary rocks are fossil-rich, while others contain no fossils.

Making fossils

Few of the billions of organisms that have lived on Earth became fossils. For fossilization to occur, an organism must contain hard parts, such as a skeleton or a shell. It has to be buried deeply right after it dies, before it decays from exposure to air, water, or bacteria.

Igneous rock

Some igneous rocks form when magma⁵ rises to the surface through cracks or volcanoes, and cools. Other igneous rocks form when magma crystallizes within Earth's crust. The word igneous means "fiery." Igneous rock does not contain fossils because the lava is so hot it burns any animals and plants it touches.

Metamorphic rock

- [10] Metamorphic rocks are rocks that are changed by heat and pressure. The word metamorphic means "change." Most metamorphic rocks are fossil-free because the pressures that changed them destroyed all evidence of fossils. Some rocks, such as slate, may contain traces of fossils, although their shapes are very different than when they were alive.

-
4. **Recede (verb):** to move back or further away from a previous position
5. hot fluid or semifluid material below or within the earth's crust

"Clues to Ancient Life" by Rona Arato from Fossils: Clues to Ancient Life by Rona Arato. Copyright © 2004 by Crabtree Publishing Company. Used with permission. All rights reserved.

2

STOP AND WRITE A QUESTION

Question Log

Student(s): _____

Class and Period: _____ Name of Text: _____

Question	Answer	Text Evidence

Question	Answer	Text Evidence

Question Log

Student(s): _____

Class and Period: _____ Name of Text: _____

Question	Answer	Text Evidence

Question	Answer	Text Evidence