Clues Beneath the Sea

Use different fossil types to test claims about ancient life.

FB.5.2 "Analyze and interpret data to support claims that different types of fossils provide evidence of the diversity of life that has existed on Earth and of the relationships between past and existing life on Earth."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline two fossil observations that support a claim about ancient diversity, circle two whale features in the table that also appear in living whales, and number one limit on what the evidence can prove.

What Ancient Seas Left Behind

1 Imagine comparing rocks from ancient coasts and seas. Fossils in these rocks record more than one kind of organism. Bones and teeth preserve body parts, while burrows record activity without preserving the animal. Tiny shells, called microfossils, can reveal organisms too small to notice without a microscope. The table combines observations from different deposits.

FOSSILS FROM ANCIENT COASTAL AND MARINE DEPOSITS

Fossil evidence	Age (millions of years)	Observed features
Early whale bones	50	Thickened ear bone; four weight-bearing legs
Later whale bones	40	Thickened ear bone; front flippers; tiny hind limbs
Shark tooth	40	Serrated tooth
Plankton microfossils	40	Microscopic shells of single-celled organisms
Trace fossil	40	Branching burrows in seafloor sediment

2 The two whale fossils come from deposits of different ages. Living whales have a thickened ear bone and front flippers, but no external hind legs. Their pelvic bones lie inside the body. Shared details can suggest an evolutionary relationship between extinct and living animals. They cannot, by themselves, prove that either fossil species was a direct ancestor of living whales.

3 Age estimates tell when a deposit formed, not whether every fossil in it came from the same species or even the same location. A burrow cannot reveal its maker's exact species, and a tooth cannot describe an entire sea. Some fossils record organisms directly; others record their activity. Examine both what each fossil shows and what remains uncertain.

2 ANSWER WITH EVIDENCE

Use the passage

1. What evidence supports a relationship between the fossil whales and living whales? Name two shared features.

2. What do three different kinds of fossil evidence from 40 million years ago suggest about the diversity of ancient marine life?

3. How do the two whale fossils show a change in body structure over time?

4. A student claims the burrow makers were direct ancestors of living seafloor animals. Does the fossil evidence support that claim? Explain one limit.

3 YOUR TURN

Your own words

Rewrite this museum sign: “One whale fossil tells the whole story of ancient ocean life.” Write a 55 to 75 word sign that makes a claim about ancient diversity and whale relationships. Use at least three fossil types from the table, compare fossil whales with living whales, and state one limit of the evidence.

ANSWER KEY

Clues Beneath the Sea

HIGH SCHOOL · FB.5.2

PART 1 · READ AND MARK

Underline two fossil observations that support a claim about ancient diversity, circle two whale features in the table that also appear in living whales, and number one limit on what the evidence can prove. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What evidence supports a relationship between the fossil whales and living whales? Name two shared features.	**The fossil whales and living whales share a thickened ear bone. The later fossil whale and living whales also have front flippers.**
2	What do three different kinds of fossil evidence from 40 million years ago suggest about the diversity of ancient marine life?	**Shark teeth show sharks, plankton microfossils show microscopic organisms, and burrows show an unidentified animal living or moving in seafloor sediment.**
3	How do the two whale fossils show a change in body structure over time?	**The 50-million-year-old whale had four weight-bearing legs. The 40-million-year-old whale had front flippers and only tiny hind limbs.**
4	A student claims the burrow makers were direct ancestors of living seafloor animals. Does the fossil evidence support that claim? Explain one limit.	**No. The burrows record activity but do not identify the animals that made them, so they cannot establish direct ancestry.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Ancient seas held more than whales. Whale bones, shark teeth, and microscopic plankton shells record animals of very different sizes, while seafloor burrows record activity by another, unidentified animal. Fossil whales share thickened ear bones with living whales, suggesting a relationship despite changes in legs and flippers. The burrows do not identify their makers, and these fossils cannot prove direct ancestry.

Accept claims that use specific fossil observations and distinguish a supported relationship from proven direct ancestry. For the sign, the three fossil types can be body fossils, microfossils, and trace fossils.