Clues in Stone

Compare fossil finds across layers of different ages.

MS-LS4-1 "Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth. (SEP: 4; DCI: LS4.A; CCC: Patterns)"

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the sentence that explains what a zero in a fossil sample can and cannot tell you. Number the table rows 1 to 4 from oldest to youngest to help you track changes over time.

What the Layers Hold

1 At a coastal dig, a team samples the same amount of rock from four layers. Deeper layers formed earlier, so the ages run from oldest to youngest in the table. Each number counts fossils found in that sample, not every animal that once lived there. The fossils came from animals that lived in the sea.

FOSSILS FOUND IN EQUAL-SIZED ROCK SAMPLES

Age (millions of years ago)	Ammonite shells	Bivalve shells	Shark teeth
90	5	2	0
75	4	4	2
55	0	6	5
35	0	3	7

2 Ammonites had coiled shells, while bivalves had two hinged shells. Shark teeth were hard enough to fossilize even when the rest of a shark did not. Fossils from one layer show which groups were present in that sample. Comparing several layers helps scientists look for patterns of life over time.

3 Across many sites, scientists find ammonites in rocks older than about 66 million years, but not in younger rocks. This wider pattern is stronger evidence for extinction than one empty sample. A fossil record is incomplete, so a zero in one sample cannot prove a group was absent from the whole ocean.

2 ANSWER WITH EVIDENCE

Use the passage

1. Which fossil groups appear in the 90-million-year-old sample? How does the number of groups change by 75 million years ago?

2. Describe the pattern in ammonite counts from the oldest sample to the youngest. What does it show about the finds at this site?

3. Compare shark tooth counts in the 75- and 35-million-year-old samples. What change in the fossil finds do they show?

4. Why is the worldwide ammonite pattern stronger evidence for extinction than the zero in the 55-million-year-old sample?

3 YOUR TURN

Your own words

A classmate says, "Sharks first lived at this site 75 million years ago because the older sample has zero shark teeth." Write three sentences that use the table to evaluate this claim, explain one limit of the evidence, and suggest fossil finds that could help test it.

ANSWER KEY

Clues in Stone

GRADES 6-8 · MS-LS4-1

PART 1 · READ AND MARK

Underline the sentence that explains what a zero in a fossil sample can and cannot tell you. Number the table rows 1 to 4 from oldest to youngest to help you track changes over time. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Which fossil groups appear in the 90-million-year-old sample? How does the number of groups change by 75 million years ago?	**Ammonites and bivalves appear at 90 million years ago. The number of groups found increases from two to three by 75 million years ago.**
2	Describe the pattern in ammonite counts from the oldest sample to the youngest. What does it show about the finds at this site?	**The counts are 5, 4, 0, and 0. Ammonites were found in the two older samples but not in the two younger ones.**
3	Compare shark tooth counts in the 75- and 35-million-year-old samples. What change in the fossil finds do they show?	**The count rises from 2 to 7 shark teeth. More shark teeth were found in the younger sample.**
4	Why is the worldwide ammonite pattern stronger evidence for extinction than the zero in the 55-million-year-old sample?	**Many sites have ammonites in older rocks but none in rocks younger than about 66 million years. A zero in one sample could result from an incomplete fossil record.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

The 90-million-year-old sample has no shark teeth, while the 75-million-year-old sample has two. One sample without shark teeth cannot show when sharks first lived at this site because not every animal becomes a fossil. Finding shark teeth in other 90-million-year-old rocks nearby would show that sharks lived here earlier.

Accept descriptions of changes in fossil finds, not unsupported claims that the counts measure animal populations. For Part 3, the suggested search should test whether sharks were present before 75 million years ago.