

Clues in Water

Annotate claims, evidence, and limits in a scientific explanation.

12.P.EICC.3 "Comprehension Strategies: Engage with a range of complex texts for a variety of tasks and purposes, accessing and using strategies for comprehension* before, during, and after reading as part of the meaning-making process."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB As you read, underline each claim about what eDNA can do, circle evidence or examples that support a claim, and number each limitation or caution. Use your marks to decide how strongly the author wants you to trust an eDNA result.

Reading Environmental DNA

- ① At the edge of a Pacific estuary, biologists can learn about wildlife without seeing it. Animals shed skin cells, scales, mucus, and waste into water. Those traces contain environmental DNA, often called eDNA. By filtering a water sample and sequencing genetic material, researchers can detect species that recently passed through an area. This method can reveal elusive fish or amphibians that visual surveys miss, especially in murky water. Yet a detection does not show how many animals are present or whether they are alive at the moment of sampling.
- ② That distinction matters when agencies use eDNA to guide decisions. A sample collected downstream may contain DNA carried by currents from another location, and genetic traces can remain after an organism has left. Results also depend on where, when, and how water is collected. To reduce error, scientists take repeated samples, compare them with controls designed to catch contamination, and pair genetic findings with netting, visual counts, or acoustic monitoring. The goal is not to replace field observation but to build a more complete picture from several kinds of evidence.
- ③ Used carefully, eDNA can change the questions investigators ask. Instead of asking only, "What did we catch today?" they can ask whether a species appears across seasons or whether an invasive organism has reached a new watershed. The method is especially useful for early detection, when a small population may be hard to find. Still, the strongest conclusion comes from interpreting a positive result alongside its limits and other observations. The passage therefore presents eDNA as a powerful clue, not a final verdict by itself.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Use your underlining to state the author's overall claim about eDNA in one sentence.

2 Which two details from paragraph 2 explain why a positive eDNA result cannot, by itself, prove that a species is currently at the sampling site?

3 How does paragraph 3 change the question investigators can ask, and what purpose does that change serve?

4 Explain how the final sentence changes how you should interpret the evidence in paragraph 1.

3 YOUR TURN _____ Your own words

Choose a complex informational article you will read for another class or about a current issue. In 60 to 80 words, write a before-reading question, describe what two kinds of details you will mark while reading, and explain how you will test your conclusion after reading.

PART 1 • READ AND MARK

As you read, underline each claim about what eDNA can do, circle evidence or examples that support a claim, and number each limitation or caution. Use your marks to decide how strongly the author wants you to trust an eDNA result. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Use your underlining to state the author's overall claim about eDNA in one sentence.	eDNA is a useful tool for detecting and monitoring species, but it should be interpreted with other evidence rather than treated as conclusive proof.
2	Which two details from paragraph 2 explain why a positive eDNA result cannot, by itself, prove that a species is currently at the sampling site?	DNA may have been carried downstream from another location, and genetic traces may remain after the organism has left.
3	How does paragraph 3 change the question investigators can ask, and what purpose does that change serve?	It shifts from asking what was caught on one day to asking about patterns across seasons or the spread of invasive species, which supports early detection and broader monitoring.
4	Explain how the final sentence changes how you should interpret the evidence in paragraph 1.	It shows that detecting DNA is a valuable clue about a species, but not final proof of the species' current presence, number, or condition.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Before reading an article about drought policy, I would ask which groups benefit and what evidence supports the proposal. While reading, I would underline claims about water use and circle data, dates, or expert findings. After reading, I would compare the article's conclusion with its evidence, note any missing perspectives, and decide whether the author treats uncertainty fairly in its analysis.

Accept equivalent wording that recognizes both eDNA's usefulness and its limits. For the open task, accept responses that include a relevant pre-reading question, two specific annotation targets, and a method for evaluating a conclusion after reading.