

EVIDENCE DETECTIVE

Purpose

Scientists haven't always agreed about how our planet works. By investigating different types of evidence, you'll figure out why ideas about Earth's processes changed over time, and what kinds of evidence are most convincing.

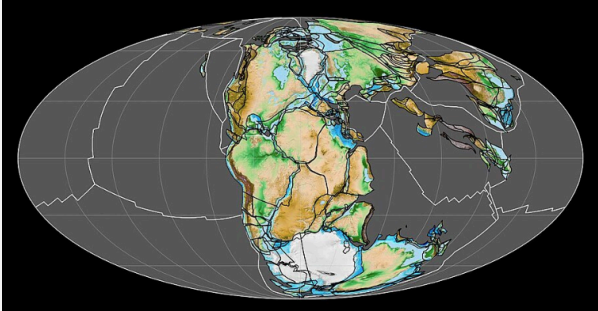
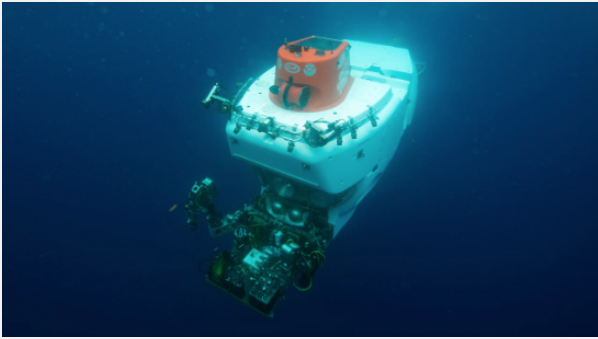
Process

1. Read the driving question and inquiry challenge:
 - a. **Driving question:** Why did scientists eventually accept new ideas about Earth's processes, even when earlier scientists had different theories?
 - b. **Inquiry challenge:** You are an evidence detective. Your job is to figure out what kinds of evidence helped scientists change their minds, and which pieces of evidence were the most convincing.
2. Make a prediction before you analyze the evidence. What do you think matters most when scientists decide to accept a new idea? Put a check by one of the options in the table below, and then write one or two sentences explaining your prediction.

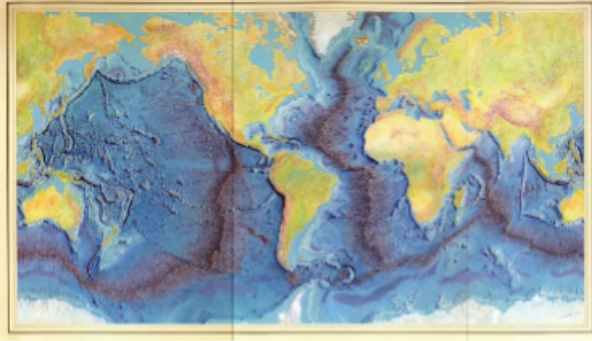
Option	Your choice (check one)	Explanation
Technology		
Evidence		
The reputation of the scientist		
Something else (write it below)		

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3. Investigate each piece of evidence in the table below and complete the rest of the table. This will help you think about how you'll answer the driving question.

Evidence	What does this evidence show?	What question could this evidence help answer?	How convincing is this evidence? Why?
 Citation: Map of Pangaea, c. 200 million years ago. By Fama Clamosa, CC BY-SA 4.0.			
 Citation: The Alvin, launched in 1964, was the first deep-sea submersible used to take pictures of the ocean floor. Image courtesy Woods Hole Oceanographic Institution.			

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Evidence	What does this evidence show?	What question could this evidence help answer?	How convincing is this evidence? Why?
 Citation: Heinrich C. Berann, "World Ocean Floor," data from manuscript by Bruce C. Heezen and Marie Tharp, Library of Congress Geography and Map Division, 1977, public domain.			
 Citation: Fossil of a lystrosaurus, an extinct lizard. These fossils have been found in Africa, Asia, and Antarctica. Natural History Museum of the University of Zurich, Switzerland. By Rama, CC BY-SA 2.0 fr.			

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4. Now look across all of the evidence to compare and evaluate. Answer the questions below.

a. Which piece of evidence seems the strongest? Why?

b. Which piece of evidence seems the least convincing? Why?

5. Different scientific disciplines use different tools and methods. Choose one or two disciplines and circle your selections.

- Chemistry
- Environmental science
- Geology
- Oceanography

6. Answer the questions below based on the disciplines you selected. You can use the [Disciplines Chart](#) to help you understand the types of questions and evidence used by each of these disciplines.

a. How would this discipline investigate the piece of evidence you chose as the strongest in question 4a?

b. What new or different types of evidence could this discipline provide?

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- c. How might this new discipline make scientists more confident in the evidence?

7. Solve the case! Write a four- or five-sentence response that answers the driving question: Why did scientists eventually accept new ideas about Earth's processes, even when earlier scientists had different theories?