

Name _____

Date _____

Luis Alvarez - Answer Key

Use the text to answer each question below.

1. Luis Alvarez was the second-born of four children. His father, Walter Alvarez, was a physician and researcher, while his mother, Harriet Alvarez, had trained as a schoolteacher. In fact, Luis’s mother taught him at home for his second grade year. As a child, Luis often accompanied his father to his research laboratory. While he wasn’t very interested in his father’s medical experiments, he was fascinated by the lab’s electrical equipment. He learned how to use many of the smaller tools.

Which is likely true of Luis Alvarez’s family?

A. They did not have much money.



B. Education was important to them.

The text states that Luis’s father had a degree in medicine, that his mother had trained as a teacher, and that his mother taught Luis at home. The text also states that Luis learned to use the tools at his father’s laboratory, which suggests that his father let him engage with the tools. From this information, we can infer that the Alvarez family valued education, both formal and informal.

C. They valued athletic competition.

D. Science was unimportant to them.

2. Luis Alvarez attended the University of Chicago, where he studied cosmic rays with a famous physicist named Arthur Compton. A cosmic ray is a tiny particle—just a fragment of an atom—that has a large amount of energy. These energetic particles can travel very fast, nearly at the speed of light. Cosmic rays originate from outside the solar system, though scientists have not yet determined their exact source. Many scientists suspect that cosmic rays are created by star explosions.

Scientists don’t know for sure _____.



A. where exactly cosmic rays come from

The text states that although scientists know that cosmic rays come from somewhere outside the solar system, they “have not yet determined their exact source.”

B. how fast cosmic rays can travel

C. how large cosmic rays are

D. whether cosmic rays have a lot of energy

3. In the 1960s, Alvarez used cosmic rays to scan an Egyptian pyramid for hidden chambers. Although he didn't find any, he proved the technique's effectiveness. In 2017, scientists used the same technique to scan the Great Pyramid of Giza. One of the seven wonders of the ancient world, this pyramid was constructed over 4,000 years ago. This time, the cosmic rays revealed a chamber that no one had known about. However, what the chamber was used for remains a mystery.

Which statement is correct?

- A. Scientists who scanned the Great Pyramid of Giza in 2017 were building on Alvarez's work.
- According to the text, Alvarez proved that cosmic rays could be used to scan pyramids in the 1960s. The text also states that scientists used this same technique to scan the Great Pyramid in Giza in 2017. This shows that the 2017 scientists built on Alvarez's earlier work.*
- B. Alvarez continued the work of scientists who scanned the Great Pyramid of Giza in 2017.
- C. Alvarez cooperated with scientists in order to scan the Great Pyramid of Giza in 2017.
- D. Scientists who scanned the Great Pyramid of Giza in 2017 disagreed with Alvarez's technique.

4. Luis Alvarez's son Walter Alvarez was a geologist. One day, Walter showed his father an interesting rock that he had chiseled from an Italian mountain gorge. The rock had a half-inch layer of clay in the middle. Walter explained that the clay layer in the rock had been laid down 65 million years ago—and it was seen not just in Italy, but throughout the world. Luis Alvarez thought this was astounding, and he had the clay analyzed. It turned out to contain a huge amount of iridium, which is an element that is plentiful in space but rare on Earth.

What did Luis Alvarez want to find out about the clay?

- A. How old the clay was
- B. How much the clay weighed
- C. What color the clay was

- D. What was in the clay
- The text states that after having the clay analyzed, Luis found out that it contained the element iridium. From this, we can infer that the reason he had it analyzed was to find out what was in it.*

5. The Alvarezes concluded that the clay's iridium came from a giant asteroid. According to their "Alvarez hypothesis," the asteroid had crashed into Earth and wiped out the dinosaurs. Many people thought this idea was incorrect. They said it was more likely that the dinosaurs disappeared gradually rather than all at once. As for the iridium in the clay, some argued that it didn't necessarily come from space. Since iridium is also found in volcanoes, they proposed that it was laid down as the result of a volcanic explosion. Despite the arguments, the Alvarezes never backed down. In 1991, a gigantic crater was discovered off the coast of the Yucatan Peninsula. This crater served as strong evidence for the asteroid collision. Today, the Alvarez impact theory is largely accepted.

With which of these statements would Luis Alvarez most likely agree?

A. Scientists should stick to work in one scientific field only.

B. If people have believed something for a long time, it is most likely true.



C. Scientists should have faith in their own ideas.

D. If many people argue with your idea, they are probably correct.

The text states that although many people didn't believe in the Alvarez hypothesis, Luis Alvarez "never backed down." He had faith in his own idea, and eventually further evidence was found for it.