



Venus? Maybe Later.

Article

PART 1

TOKYO, Japan. A Japanese space probe was supposed to begin orbiting Venus in December 2010. But it missed. Instead, the probe was captured by the sun's gravitational pull. This was a huge setback for Japan's space program. However, the probe may be able to continue the mission to Venus in six years.

The probe is named Akatsuki. It journeyed for nearly eight months to reach the second planet, Venus. Akatsuki was expected to enter an orbit around the planet. To do this, the probe needed to fire its engines as it neared Venus. This would have pushed Akatsuki into the proper orbit. But mission officials lost communication with the probe. The next day, they found that Akatsuki's engines failed to fire long enough. This prevented the probe from reaching the desired orbiting position around Venus.

Still, it wasn't all bad news. Officials were able to repair communication with the probe. Akatsuki appeared to be undamaged. It was working fine. The probe had passed Venus and headed off to orbit the sun. Officials hope that Akatsuki's engines will fire correctly when the probe nears Venus again.

"Unfortunately, [Akatsuki] did not [achieve] an orbit [around Venus]," said Hitoshi Soeno. Soeno works for JAXA. That agency runs the Japanese space program. "But it appears to be [working], and we may be able to try again when it passes by Venus six years from now."

Akatsuki was designed to record data about Venus' volcanoes. In addition, it would gather information about the planet's cloud cover and climate. This would include whether the planet experiences lightning. The probe has cameras and other instruments to gather this information.

Why did scientists want to study the climate of Venus? They hoped to learn more about how climate change works. Climate change involves a change in weather over long periods of time. It is thought to affect the atmosphere. Looking at climate change on another planet may give scientists clues about what is happening on Earth. It may help scientists know more about what is causing a gradual increase in temperatures on Earth.

The probe cost \$300 million. It would have been the first that Japan had put in orbit around another planet. Japanese scientists were hopeful that the mission would be successful. Japan recently brought a probe back from a trip to an asteroid. The failure of the Venus probe, at least for now, was a big letdown for Japan and for scientists around the world.

"The Planetary Society regrets that the [creative] Akatsuki spacecraft seems to have missed its opportunity to lock into an orbit of Venus," said Bill Nye. Nye is in charge of the Planetary Society. It is a private group that supports space exploration. "Although Akatsuki has already [achieved] some remarkable things on its voyage, this setback reminds us how difficult space exploration can be."

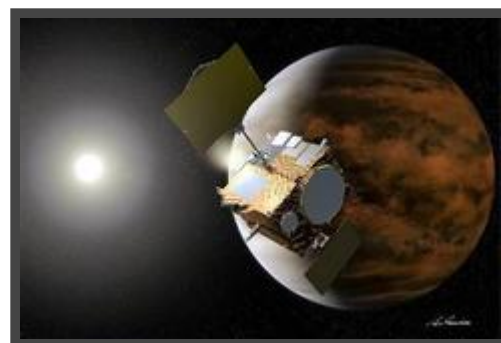


Photo credit and all related images:
AP/Akihiro Ikeshita via JAXA

Japan sent a space probe to study the planet Venus. It was not able to enter Venus' orbit and won't be able to try again for six years.

The Associated Press contributed to this story.

PART 2

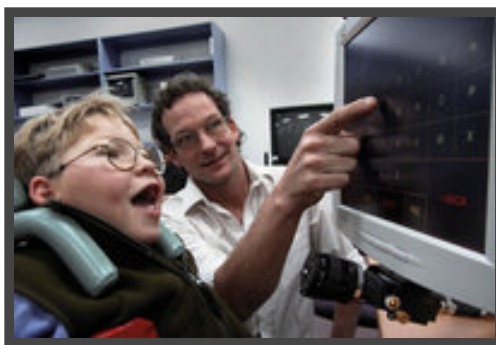
Dig Deeper

The Akatsuki probe failed to enter Venus' orbit in 2010. Japan plans to try again in December 2015. Space exploration benefits us in many ways. Throughout history, the study of stars and planets has brought about new ideas. As we meet the challenges of space exploration, we gain valuable technology.

The study of other worlds can teach us about our own. Scientists believe that Earth has changed a great deal since it formed. Scientists compare Earth with other planets. In doing this, they learn more about the history of Earth's surface features and atmosphere. Scientists are hopeful that Akatsuki's second attempt will be able to study the climate on Venus. This could help them learn more about the changes in Earth's climate.

But space exploration has done more than add to our knowledge. It has also led to new technology. This technology makes life on Earth easier. You probably benefit every day from the space program. Most likely, you use some material or product that was first developed for space. What is one of the most important benefits of space exploration? It has been the development of satellite technology. Images and data from weather satellites have greatly improved weather forecasting. Other satellites collect images of Earth's surface. The images show how the surface is being changed. It is being changed by natural events. It is also being changed by human activity. The data can be used for things like wildlife preservation and conservation of natural resources.

Have you ever come up with a new way to use something? Many technologies have been created to meet space travel needs. Engineers at NASA, the U.S. space agency, often repurpose space technologies to improve life on Earth. Smoke detectors are spinoffs of space technology. Cold weather gloves are, too. Bed mattresses and ear thermometers are also spinoffs of space technology. Everything on a spacecraft must be small. It needs to be as lightweight as possible. Why? Because the heavier a spacecraft, the harder it is to launch. Engineering design techniques have been developed to meet this need. They have also improved devices used on Earth. Some tools for diagnosing diseases are examples; so are some devices that help people overcome disabilities.



Credit: NASA

This boy is able to communicate by using eye movements. NASA engineers helped develop the system he is using.

Materials and parts on a spacecraft have to handle harsh conditions. Extreme heat and cold are examples. Fire-resistant materials were developed for the space program. Now, many homes and buildings contain these materials. Firefighters wear protective suits. They are made from special fabric. The fabric was originally used in space suits. NASA engineers have also helped design other devices that help firefighters. These devices allow firefighters to avoid injury from inhaling smoke. Humans need a safe environment in spacecraft and space stations. NASA has developed systems for purifying air, water, and food. These systems now help protect people on Earth as well as in space.

Dictionary

asteroid (*noun*) a large rock that circles the sun

communication (*noun*) the passing of information through speaking, writing, or other means

gravitational pull (*noun*) the force that pulls objects closer to a planet or star

probe (*noun*) a spacecraft that travels through space to collect information

satellite (*noun*) an object that orbits a larger object

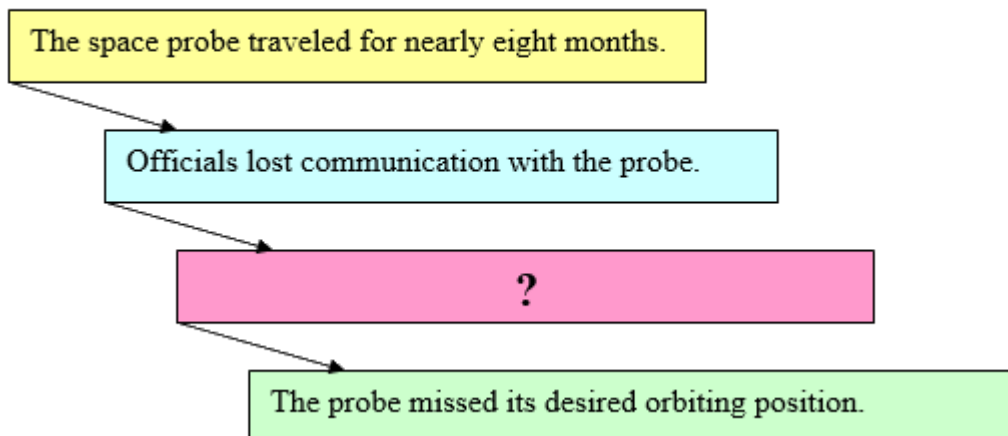
technology (*noun*) the use of scientific knowledge to solve problems and make new things

Activity

PART 1

Question 1

What Happened Next?



Based on the article, which best replaces the question mark in the diagram above?

This question asks about when events happened. It does not ask where in the article the events appear. Look back at the article for clues, such as dates.

- Ⓐ Akatsuki's engines failed to fire for a time.
- Ⓑ Officials sent the probe to orbit around the sun.
- Ⓒ Officials repaired communication with the probe.
- Ⓓ Akatsuki recorded information about Venus' volcanoes.

Question 2

What is this article mainly about?

- Ⓐ A Japanese probe was sent to study the climate of Venus, but it did not have the right tools.
- Ⓑ Bill Nye works for the Planetary Society, a group that supports space exploration.
- Ⓒ Hitoshi Soeno works for the Japanese space agency called JAXA.
- Ⓓ A Japanese probe was sent to study Venus, but it missed and headed into orbit around the sun.

Question 3

The article states:

The next day, [officials] found that Akatsuki's engines failed to fire long enough. This *prevented* the probe from reaching the desired orbiting position around Venus.

Which would be the closest **synonym** for the word *prevented*?

- (A) Helped
- (B) Stopped
- (C) Slowed
- (D) Moved

Question 4

Scientists wanted to study the climate on Venus because _____.

- (A) They wanted to see if it was possible to send an astronaut to Venus.
- (B) They wanted to see if it was possible to launch another probe from Venus.
- (C) They thought this would give clues about the climate on Earth.
- (D) They thought this would allow them to change the atmosphere on Venus.

Question 5

Based on the article, which is most likely to happen?

- (A) Scientists will gather information with the Akatsuki probe.
- (B) Scientists will get the Akatsuki probe to return to Venus next month.
- (C) Scientists will try to get the Akatsuki probe to orbit the moon.
- (D) Scientists will learn a great deal about Mars from the Akatsuki probe.

Question 6

Which two words from the article are the closest **synonyms**?

- (A) Mission and instrument
- (B) Society and group
- (C) Orbit and launch
- (D) Probe and planet

Question 7

The news article says all of the following **except** _____.

- (A) Why officials were hopeful about the probe
- (B) Why Akatsuki failed to orbit Venus
- (C) When Akatsuki may be able to try again
- (D) When the Planetary Society was formed

Question 8

Suppose you were writing a summary of the article. Which of these would be **most** important to put in the summary?

- Ⓐ The JAXA group runs the Japanese space program.
- Ⓑ The Akatsuki space probe cost Japan \$300 million.
- Ⓒ Bill Nye is in charge of the Planetary Society.
- Ⓓ A Japanese space probe failed to go into orbit around Venus.