

Team works to get "most accurate measurement" of Mount Everest

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Image 1. View from Kala Patthra toward Mount Everest, Nuptse and the Khumbu Glacier, Everest Mountain Range, Nepal. Photo by: Loop Images/Universal Images Group via Getty Images

When Khim Lal Gautam reached the top of Mount Everest at 3 A.M. on May 22, it was dark, windy and deathly cold. With him, Gautam carried a radar and a satellite navigation device.

Unlike most climbers, Gautam and his team stayed at the summit for almost two hours so they could take the measurements they needed. Other climbers usually limit their time on the peak of the highest mountain in the world and quickly descend.

Gautam had a serious case of frostbite and at the end of the trip, he lost part of his toe. Another team member almost died of a lack of oxygen while descending.

However, their efforts paid off, and they successfully completed their mission to obtain crucial pieces of data in order to determine Mount Everest's true height. Mount Everest is the world's tallest mountain.

The most commonly accepted figure for Mount Everest's height is 29,029 feet. This measurement was taken in the 1950s. Some scientists believe that the mountain may have shrunk slightly after a powerful earthquake struck Nepal in 2015.

Patriotism And Science Are Driving The Project

Now, Nepal has sent its own team for the first time. The team brought the latest surveying technology to assist with getting a new measurement of the world's tallest peak. The two-year, \$1.3 million project is driven by patriotism and science.

It could be "the most accurate measurement ever made," according to Roger Bilham. He is a geologist at the University of Colorado. The southern portion of Mount Everest belongs to Nepal, but he pointed out that foreigners have been the ones measuring the mountain's peak for 170 years.

Nepal's Survey Department will report the new height sometime early next year.

"Everyone is curious about the project," said Chief Survey Officer Susheel Dangol, who is overseeing the project. He has been fielding lots of questions on its progress and even recently installed a security system for his survey department to safeguard the Everest data.

Dangol oversees a team of 80 people who have hiked, driven and helicoptered across Nepal to gather the necessary data to make an updated measurement. They face many challenges such as transporting a \$200,000 gravimeter along rough Himalayan roads to almost 300 different spots. The gravimeter measures the force of gravity at any given location.

Two Measuring Methods Are Being Used

Everest is known as "Sagarmatha" in Nepal and as "Chomolungma" in Tibet. The search for the mountain's English name began after surveyors in India declared it the world's tallest peak in 1856. The mountain's namesake is George Everest, the prior chief surveyor of India.

Dangol's team is tackling the project with two methods. The first is to measure Everest the old-fashioned way using trigonometry. Trigonometry is how the first-ever measurement of Everest's height was recorded. It is also how the measurement was taken in the 1950s by an Indian team that still serves as the current standard.

However, Christopher Pearson said that technique will only serve to check their work. Pearson is an expert at the University of Otago in New Zealand who consulted with Nepal on the project. The different part about this effort will be the second method. It relies on a combination of readings from a satellite navigation system and a complex model of sea level.

Gautam's team of four had to carry 90 pounds of equipment in addition to their regular climbing gear. They took measurements with a Global Navigation Satellite System device. They used a radar that can penetrate the ground and measure the difference between the actual rock summit and the snow covering it.



The data they acquired weighed nothing, but Gautam said, "its preciousness made it so heavy." Still, the satellite readings from the Everest expedition were not enough information.

Processing The Data Will Take Months

The data provides the mountain's "ellipsoidal" height or the height of the summit above a smoothed geometric model of the Earth. The readings do not give an object's exact height above sea level.

A key piece of information is to determine exactly where sea level would begin beneath Everest's massive tons of rock. Generating the model of sea level required them to carry the gravimeter to 297 spots. "We have to be cautious and drive slowly," Dangol said.

The data collection will be completed by next month, and then they will begin the data processing. It will consist of a closed group of six people sitting in a room equipped with high-speed computers and specialized software. They will be checking and rechecking figures for three to four months.

Pearson said they have all the information they need to get an accurate height and called Nepal's efforts incredible.

Dangol is already looking forward to 2020 when Nepal plans to release Everest's new height. It will include both the new rock height and the snow height down to the centimeter.

Even losing a part of his toe did not decrease Gautam's pride in his work. "We are so happy because we finished our difficult task," he said. "I was ready to take [a] risk for the nation."

Quiz

- 1 Which section from the article BEST explains why Mount Everest's height might have changed since the last measurement?
- (A) Introduction [paragraphs 1-5]
 - (B) "Patriotism And Science Are Driving The Project"
 - (C) "Two Measuring Methods Are Being Used"
 - (D) "Processing The Data Will Take Months"
- 2 Select the paragraph from the section "Processing The Data Will Take Months" that explains how scientists will use the information gathered to calculate Everest's true height.
- (A) The data collection will be completed by next month, and then they will begin the data processing. It will consist of a closed group of six people sitting in a room equipped with high-speed computers and specialized software. They will be checking and rechecking figures for three to four months.
 - (B) Pearson said they have all the information they need to get an accurate height and called Nepal's efforts incredible.
 - (C) Dangol is already looking forward to 2020 when Nepal plans to release Everest's new height. It will include both the new rock height and the snow height down to the centimeter.
 - (D) Even losing a part of his toe did not decrease Gautam's pride in his work. "We are so happy because we finished our difficult task," he said. "I was ready to take [a] risk for the nation."
- 3 Which statement would be MOST important to include in a summary of the article?
- (A) Mount Everest was named after a surveyor of India but it is known to people in Nepal as "Sagarmatha."
 - (B) The last time Mount Everest was measured was by an Indian team that used trigonometry in the 1950s.
 - (C) Mount Everest has been measured mainly by foreigners since it was named the tallest mountain in the world.
 - (D) Nepal is sending its first team to measure Mount Everest using a traditional method and a new method.
- 4 Read the following paragraphs from the introduction [paragraphs 1-5].

When Khim Lal Gautam reached the top of Mount Everest at 3 A.M. on May 22, it was dark, windy and deathly cold. With him, Gautam carried a radar and a satellite navigation device.

Gautam had a serious case of frostbite and at the end of the trip, he lost part of his toe. Another team member almost died of a lack of oxygen while descending.

How is the central idea developed in these two paragraphs?

- (A) They both illustrate how the Nepal team overcame the problems they experienced while measuring Everest.
- (B) They both illustrate the old and new techniques that the Nepal team used to get Everest's measurements.
- (C) They both demonstrate how challenging and dangerous it was for the Nepal team to get Everest's measurements.
- (D) They both demonstrate that there is a sense of national pride around Nepal doing Everest's measurement.