

The High One

National Park Service

U.S. Department of the Interior

Denali National Park and Preserve



Rising 20,310 feet (6,190 meters) above sea level, Mount McKinley is the tallest mountain in North America. In Alaska Native languages like Koyukon, the mountain is called *Denali*, which means *the high one*. And high it is! It is the pinnacle of a long arc of mountains called the Alaska Range. This mountain range is being created by movement of the plates that make up the Earth's crust. The Pacific plate is slowly moving northwest and crashing into the North American plate. As the more dense Pacific plate *subducts*, or goes under, the lighter North American plate, it causes the land above it to buckle like the hood of a car during a collision. The buckled bedrock forms the Alaska Range and its highest peak.



Geologic forces are at work in Denali. Glaciers, wind, rain, frost, and water *erode* the mountains, and yet they are still growing! The Pacific plate continues to crash into and subduct beneath the North American plate, causing the highest peaks to continue growing at a rate of 1 millimeter per year. That may seem slow, but at that rate it will rise one kilometer in the next million years, a short period in geologic time.

Most people in Alaska live in cities and towns where they can sometimes see Mount McKinley looming on the horizon, marvel at the storms on its slopes, and fish the rivers that carry away the Alaska Range piece by piece. We also feel the jolt of earthquakes from movement as the plates crash together, proof of the powerful forces at work within the Earth.

Are there geologic forces at work near you? What kind of landforms do you live near?

Which Mountain is Highest?

Mountains can be measured in different ways; you can look at their overall height or their *relief*, the distance from the base to summit. Using a calculator, decide which mountain you think deserves the title of tallest mountain on Earth.



Mauna Kea in Hawai'i is a dormant volcano. 13,803 feet of Mauna Kea is above sea level, but the base of the volcano is the sea floor. 19,697 feet is underwater. What is Mauna Kea's height from base to summit?

13,803 + 19,697 feet = _____ feet



Mount McKinley is part of the Alaska Range, a 600-mile arc of mountains.

The base sits around 2,000 feet above sea level and rises to 20,310 feet. What is Mount McKinley's height from base to summit?

20,310 - 2,000 feet = _____ feet



Mount Everest in the Himalayan mountains of Asia is well-known as the tallest mountain. However, it begins on a 14,000-foot-high plain and summits at 29,028 feet. What is Mount Everest's rise from base to summit?

29,028 - 14,000 feet = _____ feet

Challenges when Climbing

Mount McKinley inspires explorers, artists, scientists, and those who are awestruck by the sight of one of the world's biggest, coldest, and most beautiful mountains. *What about the natural world inspires you?*

People from around the world attempt to climb North America's tallest peak. In doing so, they embark on a physical and mental journey that challenges them in many ways. To climb safely and successfully takes planning, training, and a little bit of luck – at least for the weather! *As you read about the challenges associated with summiting, think about a great challenge in your life. What steps did you take to overcome it? How did you feel when you overcame your challenge?*



The route: There are a few different routes up Mount McKinley. The West Buttress, West Rib, Cassin Ridge, and Muldrow are the most frequently climbed routes. In recent decades, over 90% of climbers take the West Buttress, which is pictured above. The average West Buttress attempt takes 17 to 21 days, round trip. *What challenging activity would you want to do for three weeks?*



One challenge of climbing in Denali is **weather**. Many consider Mount McKinley the coldest mountain on Earth due to its high elevation, subarctic location, and powerful winds. Wind gusts over 100 mph have been recorded at 14,200 feet. Climbers come prepared with gear that helps to prevent frostbite and hypothermia.

Trusting your team and knowing their skills is incredibly important in mountaineering. *When was the last time you were on a team?* You shared a common goal on that team and there was probably a risk that you might lose a game or do poorly on an assignment, but mountaineering teams have a lot more at stake. While traveling, especially over glaciers, teammates are roped to one another in case someone falls into a crevasse (a crack in a glacier) or down a steep slope. If one team member falls, the others stop them using their body weight and use the ropes to pull them out. *How would you feel about entrusting your life to your teammates? How might you practice for that kind of challenge?*



Altitude sickness: High in the earth's atmosphere the air is less dense, which means that there is less oxygen available to breathe. Mountaineers are exercising hard as they climb and therefore need a lot of oxygen. If they don't get enough, they can get altitude sickness, the symptoms of which include headache, nausea, and shortness of breath. On other super-high mountains like Mount Everest, climbers often use supplemental oxygen that they carry in tanks. In Denali, climbers aren't allowed to carry oxygen because the tanks can become litter which harms the environment. Instead, mountaineers plan rest days and sleeping locations carefully in order to allow their bodies to acclimate, or grow accustomed, to the elevation.

Would you ever want to try mountain climbing? Whether you come as a visitor, an employee, or a mountaineer, we look forward to welcoming you!