Math on the Mountain

By: Theresa Randolph – Legacy Elementary

Math: Measurement and Data Common Core Standard

Vocabulary: estimation, meters, feet, square feet, scale, units of measure

Key question: What are the tallest mountains on each continent?

What is Colorado’s tallest mountain?

Focus question: What impact does the height of a mountain have on the (weather, agriculture, human population) for the surrounding area?

Activity question: How can we find out the height of mountains?

Predictions: Which mountain is the highest in the world? In which state are located the tallest mountains? For each question students provide evidence as to how they know this information or where they think they will be able to find this information.

Lesson:

Students explore atlases to discover highest points on each continent.

Also use the following NOVA Explore the Seven Summits web Interactive or information below.

http://www.pbs.org/wgbh/nova/earth/explore-the-seven-summits.html

Create a chart with data. Great time to start Science Notebooks and set up the scientific method for organizing and discovering Mt. Kilimanjaro.

Using metric system, ESTIMATE the height of each mountain.

Build these heights using sticky notes as your unit of measure. Sticky notes work well because students can build up or pyramid shape to create a mountain.

Great time to introduce scale: why and how it is used.

Kindergarten and first grade: Use unifix cubes to build height of mountains.

Scale: One sticky note or unifix cube is equivalent to 1000 m.

Narrow focus down to Mt. Kilimanjaro (highest point in Africa) and Mt. Denali OR Mt. Elbert (highest point in North America and Colorado, respectively).
Measurement extensions:

Africa is Big! Africa is roughly 11,700,000 square miles. How big is that? (USA, China, Europe, Argentina, India, and New Zealand could fit inside Africa). Idea taken from Teacher Created Materials: Africa. Using a map of Africa and maps of the countries listed above, students can either cut out the countries and be challenged to fit them into their map of Africa or teacher can prepare map with countries already “puzzled” into Africa map. Great visual for primary students.

- The 7 Summits -

**Denali (Mount McKinley) - North America**
McKinley is the northernmost major peak in the world, covered by the largest expanse of snow and ice on any mountain. Temperatures on McKinley, which can fall to minus 150° with wind chill, are among the coldest anywhere on Earth.

Location: Denali National Park and Preserve, Alaska
Elevation: 20,320 feet
About the name: Named after American President William McKinley. Most mountaineers and Alaskans call this mountain Denali, which in the local Athabascan language means "The High One." Discussion remains of officially renaming the peak Denali.

**Cerro Aconcagua - South America**
The second highest of the Seven Summits, Aconcagua is sometimes called a mountaineering "bargain" because of its disproportionate ratio of elevation to effort. Climbers have tackled it on skis, mountain bikes, even motorcycles. However, this mountain should be no means be taken for granted. An average expedition takes 18 days, and many people have died from freezing, altitude sickness, and other causes while attempting to scale it.

Location: Cordillera Andes, Argentina
Elevation: 22,835 feet
First ascent: Matthew Zurbriggren, Swiss guide on an English expedition, 1897
About the name: Aconcagua comes from the traditional Incan name, Ackon Cahuak, meaning "White Sentinel."
Gora Elbrus - Europe
The twin-peaked Elbrus (or "Gora Elbrus," using the Russian word for mountain) offers climbers a formidable challenge. Moist air rising off the nearby Black Sea produces impenetrable blizzards and frigid temperatures, feeding the mountain's maze of 22 glaciers and fortifying its 56-square-mile ice cap, which is hundreds of feet deep in some areas.

Location: Caucasus Mountains, Georgia
Elevation: 18,481 feet
First ascent: Killar Khasirov, Circassian tribe, 1829 (unconfirmed); Douglas W. Freshfield, Adolphus W. Moore & C.C. Tucker, England, with French guide Françoise Devouassoud, 1868 (confirmed)
About the name: Also called Elborus locally, the derivation of this mountain's name is not known.

Mount Kilimanjaro - Africa
Kilimanjaro is topped by three dormant volcanic summits, Kibo (19,340 feet), Mawenzi, (16,896 feet), and Shira (13,140 feet). Its fabled glaciers, some of the very few on the African continent, are rapidly disappearing.

Location: Kilimanjaro National Park, Tanzania
Elevation: 19,340 feet
First ascent: Hans Meyer, Germany & Luwig Portscheller, Austria, 1889
About the name: The derivation of "Kilimanjaro" is unknown, but it might come from two Swahili words, "Kilima" and "Njaro," which together mean to "Shining Mountain."

Mount Everest - Asia
The tallest mountain in the world, Everest looms large over the Nepal/Tibet border in the Mahalangur Himal, a segment of the 1,500-mile-long Himalayan mountain range. The Himalayas are home to four of the world's fourteen peaks over 26,000 feet tall.

Location: Mahalangur Himal, Nepal/Tibet
Elevation: 29,028 feet
First ascent: Sir Edmund Hillary, New Zealand & Tenzig Norgay, Nepal, 1953
About the name: Named after Sir George Everest, British Surveyor General in India, mid-19th century. Everest is known by Tibetans as Chomolungma, "Goddess Mother of Earth" and by Nepalese as Sagarmatha, "Goddess of the Sky."
Puncak Jaya - Australasia
This limestone peak, perennially shrouded in mist, made slick by rain, and pelted with hail, rises out of an area of thick jungles and mangrove swamps in Irian Jaya, the western half of the island of New Guinea. Australasia, which geographers consider the true Down Under continent, also includes Australia, New Zealand, and the island nations of the South Pacific.

Location: Snow Mountains, Irian Jaya
Elevation: 16,020 feet
First ascent: Heinrich Harrer, Austria; Bert Huizinga, The Netherlands; Russel Kippax, Australia & Philip Temple, New Zealand, 1962
About the name: Puncak Jaya means "Victory Peak" in Indonesian. The mountain is also known as Carstensz Pyramid, named for Dutch explorer Jan Carstensz, who was the first European to sight the mountain in the 17th century, and for its pyramid-like shape.

Vinson Massif - Antarctica
Vinson dominates a landscape of stark purity, where nothing other than ice, snow, and barren rock stretch as far as the eye can see. Antarctica, with Vinson at its ceiling, is the coldest and driest desert on Earth, receiving less than two inches of precipitation per year. Most of the snow on the mountain arrived there on the wind, blown from other parts of the continent.

Location: Sentinel Range, Ellsworth Mountains
Elevation: 16,067 feet
About the name: Named after Carl Vinson, a U.S. Congressman from Georgia (1914 to 1965) who supported Antarctic research. A "massif" is a large mountain that forms an independent portion of a mountain range.