Welcome to 9th Grade Geography!

This packet is a bit of review before we begin our work in class this fall. These are things that you have already learned in Elementary or Middle School so hopefully you remember most of it and can spend summer having fun!

Directions:

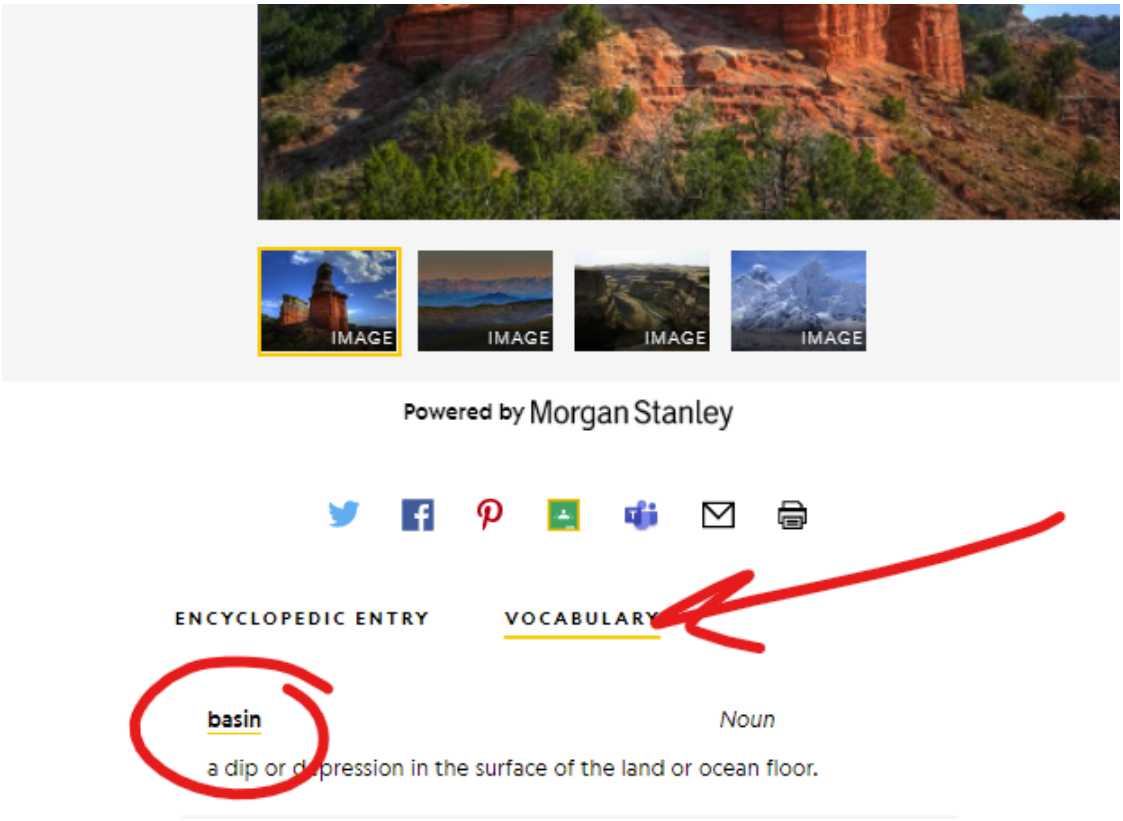
50 States/ Capitals (Pages 2-3)

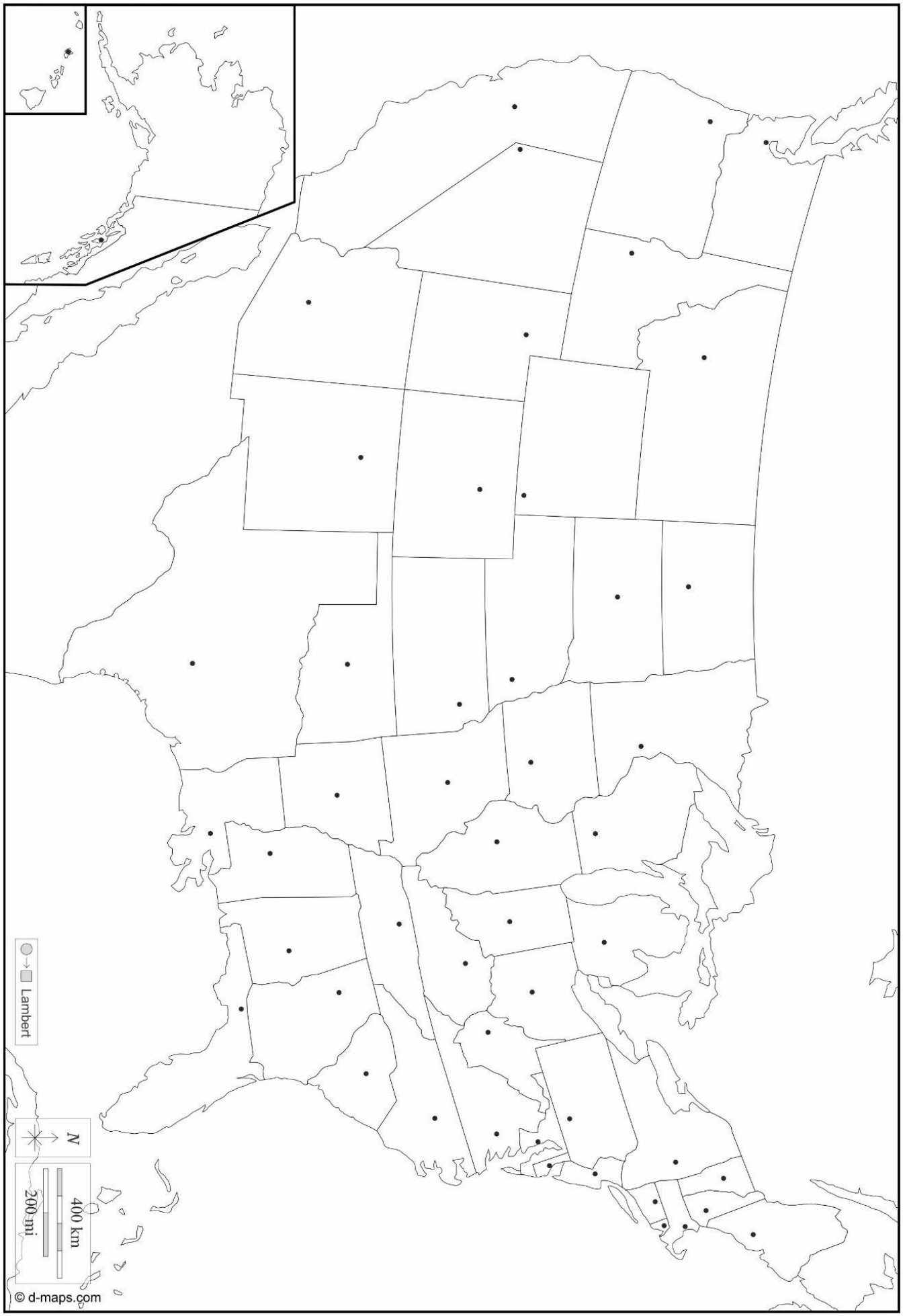
We have included a labeled map and blank map for you to complete for a grade. On this map you will label all 50 states and their capitals. We will have our first alpha (quiz) 2 weeks into the semester where you will do your best to label all 50 states and capitals. One of the best ways to study is in small chunks- reviewing your completed map for maybe 10 minutes a week should be more than enough.

Landforms (Pages 4-5)

On this organizer you will use the National Geographic website to define different types of landforms and describe how they are formed. We expect 1-2 sentences, bullet points are sufficient. Using the linked article, click on VOCABULARY (the arrow below) for the definition.

You will also draw an example of each landform in the box on the right. And don't worry- your teachers are not artists and will be happy with a clear doodle. The underlined vocabulary words (circled below) will take you to the formation information, it also has images to inspire your illustration. The first landform is completed as an example. If you don't want to navigate the National Geographic website use the documents at the end of this packet.

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New York
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Augusta
Montpelier, Vermont
Concord, New Hampshire
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Salt Lake City
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Topeka
Kansas
Jefferson City
Missouri
Arkansas
Little Rock
Louisiana
Baton Rouge
Oklahoma
Oklahoma City
Texas
Austin
Sante Fe
New Mexico
Arizona
Phoenix
Alaska
Juneau
Honolulu
Hawaii

Landforms:	**Drawing:**
Basin Definition: *a dip or depression in the surface of the land or ocean floor.* *Major types: river drainage, structural, and ocean.* How it's formed: *forces above the ground (like erosion) or below the ground (like earthquakes); can be over thousands of years or almost overnight*	
Butte Definition: How it's formed:	
Canyon Definition: How it's formed:	
Cliff Definition: How it's formed:	
Hill Definition: How it's formed:	
Mountain Definition: How it's formed:	

Plain Definition: How it's formed:	
Plateau Definition: How it's formed:	
Sea Level Definition: What causes changes:	
Plate Tectonics Definition: Data that support the idea:	
Terrain Definition: How it's formed: Why Terrain is studied:	
Valley Definition: How it's formed:	

landform

nationalgeographic.org/encyclopedia/landform

August 8, 2011

basin
a dip or depression in the surface of the land or ocean floor.

butte
single hill or rock formation that rises sharply from a flat landscape, usually in a desert.

canyon
deep, narrow valley with steep sides.

hill
land that rises above its surroundings and has a rounded summit, usually less than 300 meters (1,000 feet).

mountain

landmass that forms as tectonic plates interact with each other.

mountain range

series or chain of mountains that are close together.

plain

flat, smooth area at a low elevation.

plateau

large region that is higher than the surrounding area and relatively flat.

sea level

base level for measuring elevations. Sea level is determined by measurements taken over a 19-year cycle.

tectonic plate

massive slab of solid rock made up of Earth's lithosphere (crust and upper mantle). Also called lithospheric plate.

terrain

topographic features of an area.

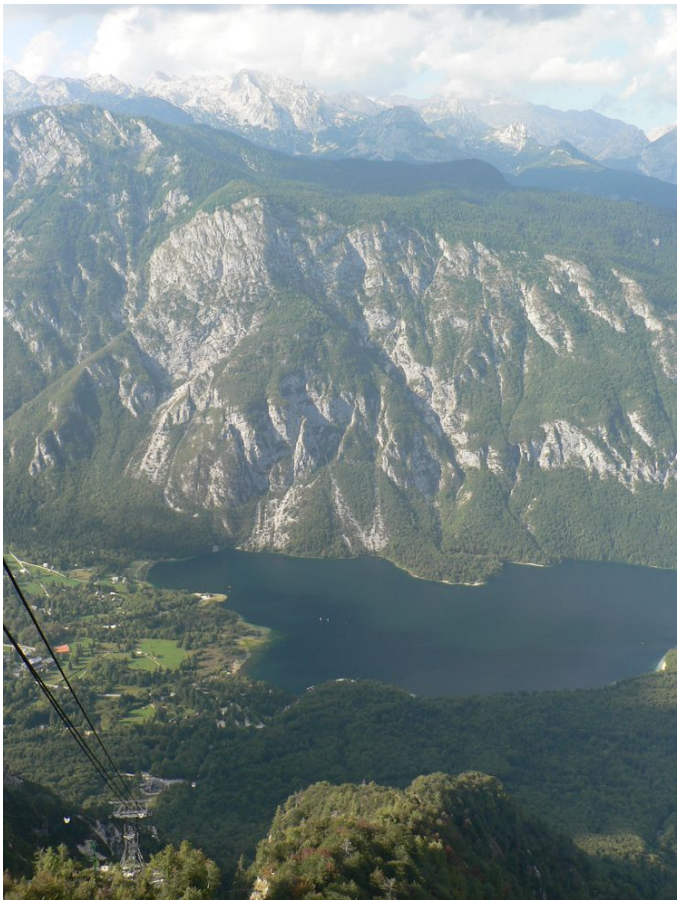
valley

depression in the Earth between hills.

basin

nationalgeographic.org/encyclopedia/basin

January 21, 2011



A basin is a depression, or dip, in the Earth's surface. Basins are shaped like bowls, with sides higher than the bottom. They can be oval or circular in shape, similar to a sink or tub you might have in your own bathroom. Some are filled with water. Others are empty.

Basins are formed by forces above the ground (like erosion) or below the ground (like earthquakes). They can be created over thousands of years or almost overnight.

The major types of basins are river drainage basins, structural basins, and ocean basins.

A river is an area drained by a river and all of its tributaries. A river basin is made up of many different watersheds.

butte

nationalgeographic.org/encyclopedia/butte

August 1, 2013

Buttes are tall, flat-topped, steep-sided towers of rock. Buttes were created through the process of erosion, the gradual wearing away of earth by water, wind, and ice.

Buttes were once part of flat, elevated areas of land known as mesas or plateaus. In fact, the only difference between a mesa and a butte is its size. Most geographers say a butte is taller than it is wide, while a mesa is a much larger, slightly less elevated feature.

Buttes are created as streams slowly cut through a mesa or plateau. The hard top layers of buttes, called caprock, resist weathering and erosion. As a result, the formations stay about the same height as the original plateau or mesa.

Weathering and erosion, most often by wind and rainwater, slowly erode the softer rock surrounding the caprock. Caprock protects the more vulnerable rock beneath it. Buttes slowly become slender spires. Eventually, even the caprock falls prey to severe weathering and erosion. Debris that falls to the side of buttes is called scree or talus.

Buttes usually form in arid regions, such as those in Mexico and the southwestern United States. Monument Valley, in the U.S. states of Utah and Arizona, has the most famous collection of buttes in the world. The buttes of Monument Valley have been the setting for many movies and television series, from *Forrest Gump* to *Easy Rider*.

Canyons

Formed by rivers making deep cuts within the Earth's terrain.

Bound by cliffs and cut by erosion, canyons are deep, narrow valleys in the Earth's crust that evoke superlatives and a sense of wonder. Layers of rock outline stories of regional geology like the table of contents to a scientific text.

The landforms commonly break parched terrain where rivers are the major force that sculpts the land. They are also found on ocean floors where the currents dig underwater grooves.

"Grand" is the word used to describe one of the most famous canyons of all. Cut by the Colorado River over the last few million years, the Grand Canyon is 277 miles (446 kilometers) long, more than 5,000 feet (1,500 meters) deep, but only 18 miles (29 kilometers) across at its widest yawn.

Layers of rock in the Grand Canyon tell much about the Colorado Plateau's formative years: a mountain range built with two-billion-year-old rock and then eroded away; sediments deposited from an ancient sea; more mountains; more erosion; another sea; a burst of volcanic activity; and the birth of a river that has since carved the chasm by washing the layers away.

Each layer erodes differently. Some crumble into slopes, others sheer cliffs. They stack together like a leaning staircase that leads to the river's edge. A mixture of minerals gives each layer a distinctive hue of yellow, green, or red.

Types of Canyons

Other canyons start where a spring sprouts from the base of a cliff. Such cliffs are composed of permeable, or porous, rock. Instead of flowing off the cliff, water seeps down into the rock until it hits an impermeable layer beneath and is forced to leak sideways. Where the water emerges, the cliff wall is weakened and eventually collapses. A box canyon forms as sections of wall collapse further and further back into the land. The heads of these canyons are marked by cliffs on at least three sides.

Slot canyons are narrow corridors sliced into eroding plateaus by periodic bursts of rushing water. Some measure less than a few feet across but drop several hundred feet to the floor.

Submarine canyons are similar to those on land in shape and form, but are cut by currents on the ocean floor. Many are the mere extension of a river canyon as it dumps into the ocean and flows across the continental shelf. Others are gouged from turbid currents that occasionally plunge to the ocean floor.

cliff

nationalgeographic.org/encyclopedia/cliff

March 4, 2013

A cliff is a mass of rock that rises very high and is almost vertical, or straight up-and-down. Cliffs are very common landscape features. They can form near the ocean (sea cliffs), high in mountains, or as the walls of canyons and valleys. Waterfalls tumble over cliffs.

Cliffs are usually formed because of processes called erosion and weathering. Weathering happens when natural events, like wind or rain, break up pieces of rock. In coastal areas, strong winds and powerful waves break off soft or grainy rocks from hardier rocks. The harder rocks are left as cliffs.

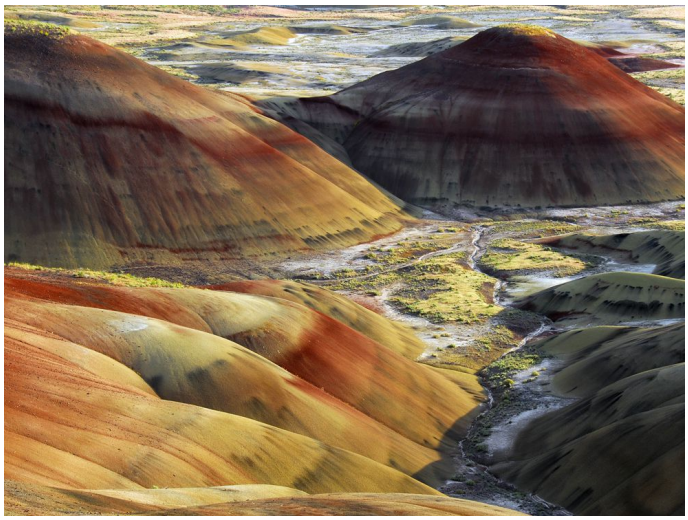
The tiny pieces of rocks broken off by weathering are called sediment or alluvium. Erosion is the process of transportation of this sediment. On sea cliffs, sediment becomes part of the seafloor and is washed away with the waves. On inland cliffs, sediment is often carried away by rivers or winds.

Larger rocks broken off by sediment are called scree or talus. Scree builds up at the bottom of many inland cliffs as rocks tumble down. These piles are called scree slopes or talus piles. Some scree slopes can be so large that soil and sediment can build up between the rocks, allowing trees and other vegetation to grow on the slope.

hill

nationalgeographic.org/encyclopedia/hill

January 21, 2011



A hill is a piece of land that rises higher than everything surrounding it. It looks like a little bump in the Earth. Since theyre higher than everything around them, hills are good places to get a nice view.

Hills are easier to climb than mountains. They are less steep and not as high. But, like a mountain, a hill will usually have an obvious summit, which is its highest point.

According to the U.S. Geological Survey, there is no official difference between hills and mountains. The United Kingdom and the United States used to define hills as summits less than 1,000 feet. However, both countries abandoned the distinction in the mid-twentieth century.

Sometimes, you'll find a hill made by people. This is called a mound. In the Midwest region of North America, a network of Native Americans known as the Hopewell created huge mounds. In fact, the Hopewell people are often called Mound Builders. The most well-known mounds are in Hopewell Culture National Historical Park, in the U.S. state of Ohio.

Natural hills are formed all the time, by different types of geologic activity. One of these activities is faulting, which happens because the rocks underneath the Earth's surface are constantly moving and changing the landscape. Hills formed by faulting can eventually become mountains. The Himalayas in Asia, the tallest mountain range in the world, were once tiny hills. The Himalayas continue to grow because of faulting activity beneath the Earths surface.

Hills are also formed because of erosion, which happens when bits of rock, soil, and sediment get washed away and placed in a pile somewhere else.

Hills can be destroyed by erosion, as material is worn away by wind and water. Hills can also be created by erosion, as material from other areas is deposited near the hill, causing it to grow. A mountain may become a hill if it is worn down by erosion.

Mountains

nationalgeographic.com/science/article/mountains

The mighty chunks rise all over the world, including the oceans. They usually have steep, sloping sides and sharp or rounded ridges, and a high point, called a peak or summit. Most geologists classify a mountain as a landform that rises at least 1,000 feet (300 meters) or more above its surrounding area. A mountain range is a series or chain of mountains that are close together.

How Are Mountains Formed?

The world's tallest mountain ranges form when pieces of Earth's crust—called plates—smash against each other in a process called plate tectonics, and buckle up like the hood of a car in a head-on collision. The Himalaya in Asia formed from one such massive wreck that started about 55 million years ago. Thirty of the world's highest mountains are in the Himalaya. The summit of Mount Everest, at 29,035 feet (8,850 meters), is the highest point on Earth.

The tallest mountain measured from top to bottom is Mauna Kea, an inactive volcano on the island of Hawaii in the Pacific Ocean. Measured from the base, Mauna Kea stands 33,474 feet (10,203 meters) tall, though it only rises 13,796 feet (4,205 meters) above the sea.

Volcanic mountains form when molten rock from deep inside the Earth erupts through the crust and piles up on itself. The islands of Hawaii were formed by undersea volcanoes, and the islands seen above water today are the remaining volcano tops. Well-known volcanoes on land include Mount St. Helens in Washington State and Mount Fuji in Japan. Sometimes volcanic eruptions break down mountains instead of building them up, like the 1980 eruption that blew the top off Mount St. Helens.

When magma pushes the crust up but hardens before erupting onto the surface, it forms so-called dome mountains. Wind and rain pummel the domes, sculpting peaks and valleys. Examples include the Black Hills of South Dakota and the Adirondack Mountains of New York. Plateau mountains are similar to dome mountains, but form as colliding tectonic plates push up the land without folding or faulting. They are then shaped by weathering and erosion.

Other types of mountains form when stresses within and between the tectonic plates lead to cracking and faulting of the Earth's surface, which forces blocks of rock up and down. Examples of fault-block mountains include the Sierra Nevada in California and Nevada, the Tetons in Wyoming, and the Harz Mountains in Germany.

Plains

nationalgeographic.com/science/article/plains

Plains are present in many regions around the world and can hide a tumultuous geography beneath their level surface.

Broad and flat, plains are well named. Some appear when glaciers and streams erode away elevated terrain; others spread where rising magma pushes, erupts, and spews. Some plains spill into the oceans, and others are bound by mountains on several sides. They all hide a tumultuous geologic history beneath their level disguise.

The base of the vast Great Plains in North America formed when several small pieces of continental crust collided and welded together more than a billion years ago. As time marched forward, the base was filled with marine sediments as periodic shallow seas covered the region and glaciers, rivers, and streams eroded the Rocky and Appalachian Mountains. Today, mountain erosion continues to carry debris out onto the plains.

When melting snows and heavy rains fill rivers beyond their banks, they flood. The waters spread out over the surrounding landscape and drop the load of mud, sand, and silt they normally channel downstream. Over thousands of years, the sediments build up floodplains.

plateau

nationalgeographic.org/encyclopedia/plateau

January 21, 2011

A plateau is a flat, elevated landform that rises sharply above the surrounding area on at least one side. Plateaus occur on every continent and take up a third of the Earths land. They are one of the four major landforms, along with mountains, plains, and hills.

There are two kinds of plateaus: dissected plateaus and volcanic plateaus. A dissected plateau forms as a result of upward movement in the Earths crust. The uplift is caused by the slow collision of tectonic plates. The Colorado Plateau, in the western United States, has been rising about .03 centimeter (.01 inch) a year for more than 10 million years.

A volcanic plateau is formed by numerous small volcanic eruptions that slowly build up over time, forming a plateau from the resulting lava flows. The North Island Volcanic Plateau covers most of the central part of the North Island of New Zealand. This volcanic plateau still has three active volcanoes: Mount Tongariro, Mount Ngauruhoe, and Mount Ruapehu.

Erosion can influence the shape of a plateau. Soft rock often erodes away on the top of a plateau. Many plateaus are therefore topped with a hard, durable surface called caprock. Caprock protects the plateau from erosion of the soil underneath it.

Valleys form when river water cuts through the plateau. The Columbia Plateau, between the Cascade and Rocky mountains in the northwestern United States, is cut through by the Columbia River.

Erosion shapes plateaus in other ways. Sometimes, a plateau is so eroded that it is broken up into smaller raised sections called outliers. Many outlier plateaus are composed of very old, dense rock formations. Ironore and coal often are found in plateau outliers.

sea level

nationalgeographic.org/encyclopedia/sea-level

September 14, 2011

Sea level is the base level for measuring elevation and depth on Earth.

Because the ocean is one continuous body of water, its surface tends to seek the same level throughout the world. However, winds, currents, riverdischarges, and variations in gravity and temperature prevent the sea surface from being truly level.

So that the surface of the ocean can be used as a base for measuring elevations, the concept of "local mean sea level" has been developed. In the United States and its territories, local mean sea level is determined by taking hourly measurements of sea levels over a period of 19 years at various locations, and then averaging all of the measurements.

The 19-year period is called a Metonic cycle. It enables scientists to account for the long-term variations in the moon's orbit. It also averages out the effects of local weather and oceanographic conditions.

Sea level is measured in relation to the adjacent land. Just like the ocean, the elevation of land may rise and fall over time. For example, the tremendous weight of a glacier on land pushes the land down, closer to sea level. That same land bounces back (a process called post-glacial rebound) if the ice retreats, or melts, and its weight is removed.

Local mean sea level measurements are a combination of sea level variations and movement of the land.

Changes in Sea Level

Sea level may vary with changes in climate. During past ice ages, sea level was much lower because the climate was colder and more water was frozen in glaciers and ice sheets. At the peak of the most recent ice age, about 18,000 years ago, sea level was perhaps 100 meters (300 feet) lower than it is today.

Global warming, the current period of climate change on Earth, is causing glaciers and ice sheets to melt. Melting ice sheets cause an elevation in sea level. This phenomenon is called sea level rise.

Sea level rise threatens low-lying areas around the world. Island nations, such as Maldives and Comoros, are particularly at risk. Coastal cities, such as New York City, New York, and Mumbai, India, must also prepare for higher sea levels.

What Is Terrain?

worldatlas.com/articles/what-is-terrain.html

Sharon Omondi March 7, 2018

Terrain is a derivative of the word “terra” meaning earth. It refers to the horizontal and vertical versions of the land surface. To describe the terrain of the land, one uses factors such as the slope, elevation, and orientation of the land. The terrain of land affects the flow and distribution of water. Furthermore, in extensive land tracts, the terrain of land often affects the weather pattern and climate of the area. The terrain is the equivalent of bathymetry which measures the terrain of underwater surfaces.

Geomorphology

Geomorphology is the study of the formation of terrains. There are three major processes involved in the formation of terrains: geological process, erosional process, and meteorite impacts. The geological process consists of activities such as river formations, volcanic eruptions, faulting and folding, and tectonic plates’ movements. The erosional process, on the other hand, involves weathering processes on land. They include wind erosion, water erosion, and landslides. Concerning human settlement, some of these processes such as volcanic activities and landslides are detrimental to humans. In most cases, people stay away from land which is prone to experiencing these activities. Failure to do so may lead to deaths of many as has been witnessed in the past. The most recent mudslide that occurred in Sierra Leone claimed lives of an estimated number of 1,050 people. Over 5,000 people were affected by the mudslide. The third way in which terrains are formed is the meteorite impacts. Whenever meteorites fall to earth, they form craters filled with meteorite ores.

Importance of the Study Of Terrain

Firstly, the terrain of land is responsible for determining its suitability for human settlement. The flat and plain land is normally good for human habitation while steep land is not suitable for the same. Secondly, understanding terrains is significant for agricultural purposes. It enables the owners of the land to be informed about the water movement, drainage features, and watershed boundaries. Thirdly, the description of the terrain allows for soil conservation efforts such as contour plowing. Contour plowing is necessary for making sloping land plausible. Fourthly, terrains also have military importance. They assist military forces in developing strategies related their defensive and offensive attacks while at war. Mountains and forest regions are particularly good for war since the soldiers can hide from their adversaries and ambush them when they least expect an attack. The fifth significance of terrains is related to the weather patterns. Differences in elevation and the nature of the terrain influences temperature and precipitation levels. Finally, terrains affect aviation especially for aircrafts which have low-flying routes and altitudes of airports. The understanding of terrains helps them avoid an accident.

Plate Tectonics

nationalgeographic.org/encyclopedia/plate-tectonics

June 10, 2020

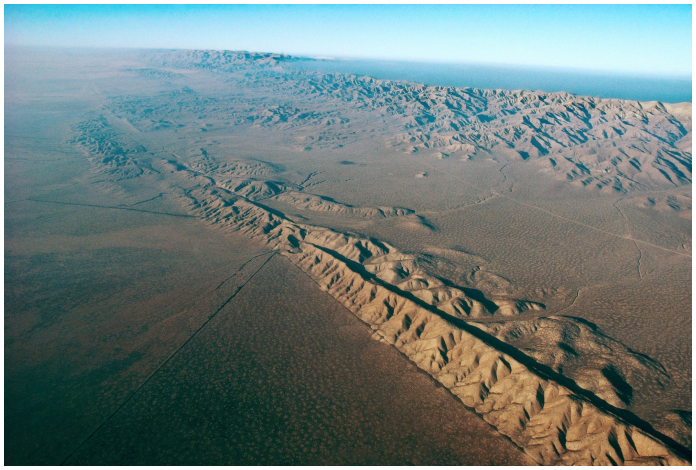


Plate tectonics is a scientific theory that explains how major landforms are created as a result of Earth's subterranean movements. The theory, which solidified in the 1960s, transformed the earth sciences by explaining many phenomena, including mountain building events, volcanoes, and earthquakes.

In plate tectonics, Earth's outermost layer, or lithosphere—made up of the crust and upper mantle—is broken into large rocky plates. These plates lie on top of a partially molten layer of rock called the asthenosphere. Due to the convection of the asthenosphere and lithosphere, the plates move relative to each other at different rates, from two to 15 centimeters (one to six inches) per year. This interaction of tectonic plates is responsible for many different geological formations such as the Himalaya mountain range in Asia, the East African Rift, and the San Andreas Fault in California, United States.

The idea that continents moved over time had been proposed before the 20th century. However, a German scientist named Alfred Wegener changed the scientific debate. Wegener published two articles about a concept called continental drift in 1912. He suggested that 200 million years ago, a supercontinent he called Pangaea began to break into pieces, its parts moving away from one another. The continents we see today are fragments of that supercontinent. To support his theory, Wegener pointed to matching rock formations and similar fossils in Brazil and West Africa. In addition, South America and Africa looked like they could fit together like puzzle pieces.

Despite being dismissed at first, the theory gained steam in the 1950s and 1960s as new data began to support the idea of continental drift. Maps of the ocean floor showed a massive undersea mountain range that almost circled the entire Earth. An American geologist named Harry Hess proposed that these ridges were the result of molten rock rising from the asthenosphere. As it came to the surface, the rock cooled, making new crust and spreading the seafloor away from the ridge in a conveyer-belt motion. Millions of years later, the crust would disappear into ocean trenches at places called subduction zones and cycle back into Earth. Magnetic data from the ocean floor and the relatively young age of oceanic crust supported Hess's hypothesis of seafloor spreading.

There was one nagging question with the plate tectonics theory: Most volcanoes are found above subduction zones, but some form far away from these plate boundaries. How could this be explained? This question was finally answered in 1963 by a Canadian geologist, John Tuzo Wilson. He proposed that volcanic island chains, like the Hawaiian Islands, are created by fixed "hot spots" in the mantle. At those places, magma forces its way upward through the moving plate of the sea floor. As the plate moves over the hot spot, one volcanic island after another is formed. Wilson's explanation gave further support to plate tectonics. Today, the theory is almost universally accepted.

Valleys

These geological formations are created by running rivers and shifting glaciers.

Valleys are depressed areas of land–scoured and washed out by the conspiring forces of gravity, water, and ice. Some hang; others are hollow. They all take the form of a "U" or "V."

Rivers and streams make most primary valley cuts, carving steep-walled sides and a narrow floor that from afar looks like the letter "V." The gradient of the river—how quickly it drops—helps define the steepness of the sides and the width of the floor. Mountain valleys, for example, tend to have near-vertical walls and a narrow channel, but out on the plains, the slopes are shallow and the channel is wide.

As waters wind toward the sea, they add to natural twists in the land by stripping sediment from the outsides of bends and dumping it on the insides. The bulk of the rock and dirt is dredged from the bottom of the channel, a process called down cutting that can ultimately lead to deep, slender chasms like Black Canyon in Colorado's Gunnison National Park.