Introduction

As we admire the landscapes of the planet Earth, we find that some of the most spectacular sceneries are the high peaks and the steep canyons of the landform that we call **mountains**. The majestic outlines of this landform never seem to change; however, we know that Earth's surface is constantly changing. Evidence of folding, faulting, or volcanism can be seen in mountains. Mountains can also be changed by erosion from wind, water, and ice.

Mountains are indicators of the past or present changes of Earth's surface. Understanding the events that occur in the formation of mountains will help us to understand better the evolution of our planet Earth.

Mountains

Mountains are landforms that are at least 600 meters above the surrounding lands. Those less than 600 meters are called **hills**. This difference in height or elevation among landforms is called **relief**.

Some common features of mountains include the following: the **summit**, or the top of a mountain; the **slope**, or side of the mountain; and a very steep valley between young mountains, known as a **gorge**.

The Rocky Mountains and the Himalayan Mountains are examples of **mountain ranges**—a series of mountains parallel to each other. A group of mountain ranges is called a **mountain system**. For example, the mountain systems of the United States include the Rockies and the Appalachians.

mountain range

Mountain formations change over time. Different types of **weathering** such as wind, water, and ice will wear away mountains. For example, **glaciers**, large, moving masses of ice and snow, are found on some mountains. As a glacier moves through a mountain range, it will carve valleys and peaks, changing the surface of the mountains. The Matterhorn in Switzerland is an example of a peak formed by a glacier.

When a mountain is young, it is usually bigger than an older mountain. The valleys of young mountain ranges are steep and narrow. The valleys of old mountain ranges are wide. The Appalachian Mountain range is an example of an old mountain system; while the Rocky Mountains are an example of a young mountain system.

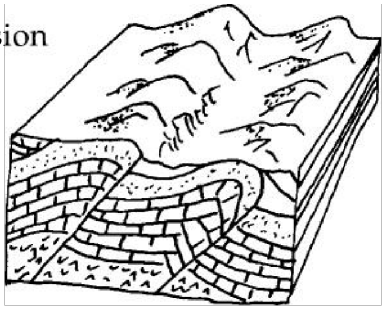
	Young Mountains	Old Mountains
size	larger	smaller
appearance	rugged	worn by erosion
valleys	steep and narrow	wide
example	Rocky Mountains	Appalachian Mountains

Types of Mountains

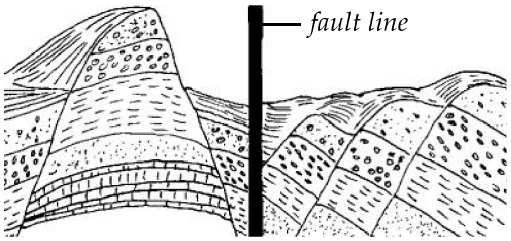
The world's largest mountain ranges are **folded mountains**—mountains formed as a result of the bending of rocks in Earth's crust. These include the Rocky and Appalachian mountains of the United States, the Himalayan Mountains in Asia, the Alps of Europe, and the South American Andes. These ranges were formed over millions of years.

During the formation, sediment is deposited in areas along continental margins where the crust sinks. As the sediments are buried deeper and deeper, the pressure on the sediments increases greatly. Since they are sinking deeper into Earth, their temperature increases. This increase in temperature and pressure causes the sediment to become folded, warped, and twisted. As this happens, the sediments are uplifted to form folded mountains.

Some folded mountains are formed by the collision of crustal plates. These collisions occurred very slowly over long periods of time as the continents moved to their current positions. The Himalayan Mountains were formed when India *crashed* into Asia and pushed up the tallest mountain range on the continents. In South America, the Andes Mountains were formed by the collision of the South American continental plate and the oceanic Pacific plate.



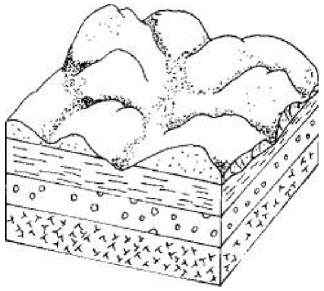
folded mountains



fault-block mountain

Fault-block mountains are formed by the movement of large amounts of rock along a crack in Earth's crust. Pressure within Earth can break apart Earth's crust. The rock that makes up Earth's crust will split. This breaking or splitting of the rocks is called a fault. The rising land between two faults can become a fault-block mountain. The Grand Tetons of Wyoming and the Sierra Nevada mountain range of California are examples of mountains formed by faulting.

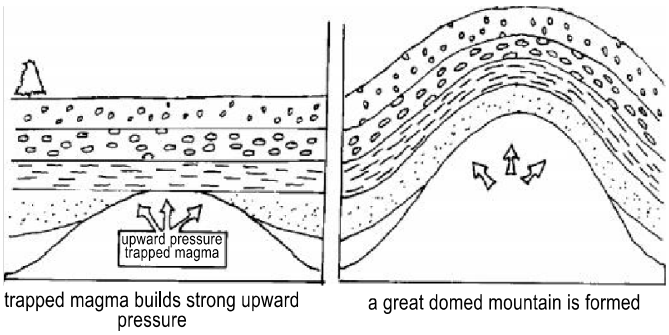
The mountains in New Zealand are examples of **dissected mountains**. Dissected mountains are formed by the erosion of a **plain** or **plateau** usually by a river or stream. These mountains will eventually wear down to sea level.



dissected mountain

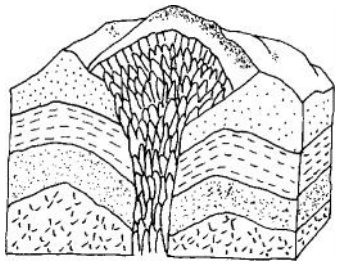
Another type of mountain is a **dome mountain**. These mountains are formed when the rocks are pushed up by internal forces within Earth, creating a dome-shaped mountain.

Magma under the surface of Earth has great pressure. If this magma is trapped, it builds up pressure. As it builds up pressure, it pushes upward, causing the layers of rock to rise. Even though these layers of rock are pushed upward, the magma cannot break the crust above it. The crust is then lifted and a dome mountain is formed.



dome mountain

Dome mountains are rounded. They are not as high as folded mountains or fault-block mountains. In the United States, dome mountains are found in the Black Hills of South Dakota and the Adirondacks in New York.



volcanic mountain

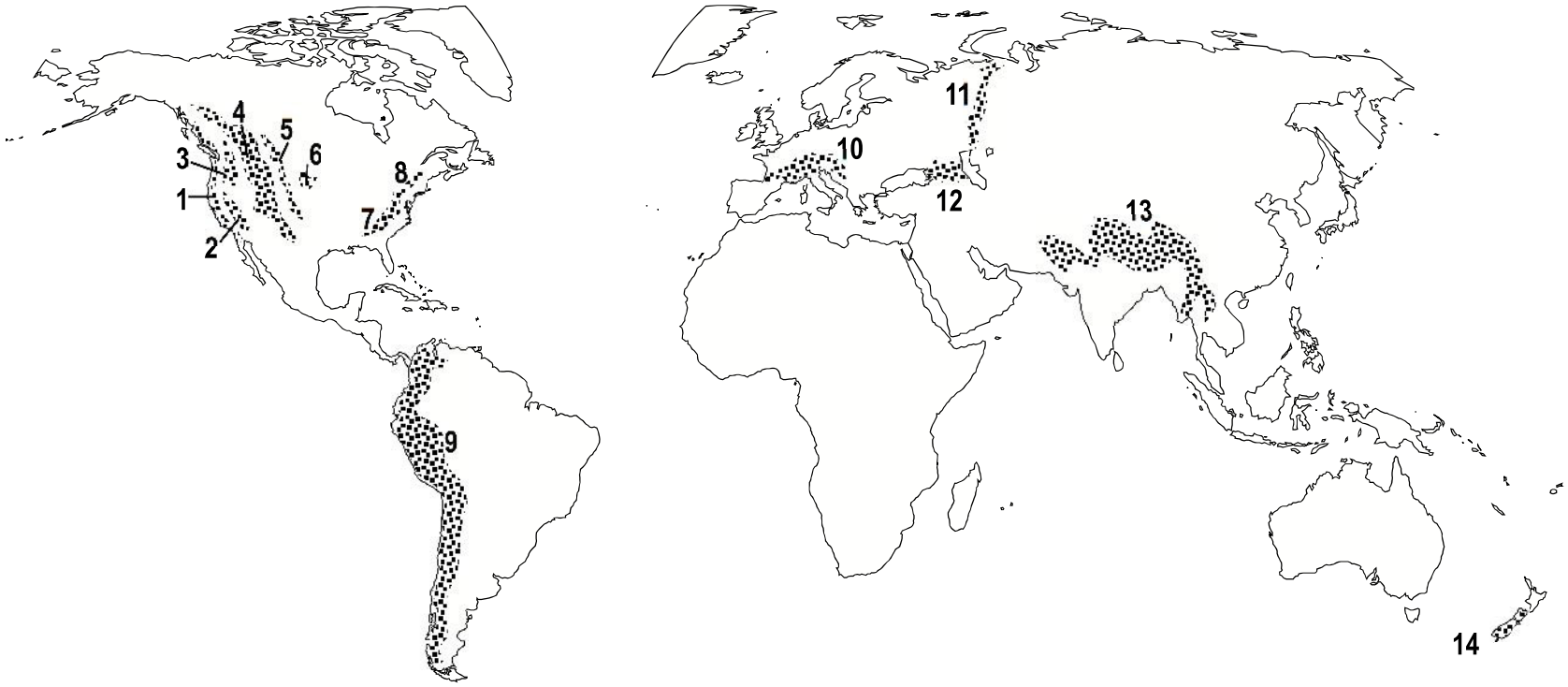
As the name suggests, **volcanic mountains** are formed by volcanoes. Lava and other igneous material from volcanoes have formed mountains in many different areas of the world. The Cascades of Washington (which includes Mount St. Helens) are volcanic mountains. Sometimes these mountains become active volcanoes and erupt like Mount St. Helens in 1980 and the Philippines' Mount Pinatubo volcano in 1991.

Types of Mountains	Examples
Folded	Rockies; Appalachians; Himalayas; Alps; Andes
Fault-Block	Sierra Nevada; Grand Tetons
Dissected	New Zealand
Dome	Adirondacks; Black Hills
Volcanic	Cascades

Ages of Mountain Ranges

Range	Continent	Age (in years)	Type
Cascades	North America	1,000,000	volcanic
Himalayas	Asia	25,000,000	folded
Alps	Europe	40,000,000	folded
Andes	South America	70,000,000	folded
Rockies	North America	70,000,000	folded
Coast Ranges/Sierra Nevadas	North America	135,000,000	fault-block
Juras	Europe	135,000,000	folded
Caucasus	Eurasia	225,000,000	folded
Urals	Eurasia	225,000,000	folded
Appalachians	North America	225,000,000	folded
Green Mountains (Vermont)	North America	500,000,000	dome
Adirondack Mountains	North America	2,500,000,000	dome

Study the map of the mountain ranges on the next page.



1. Pacific Coastal Range
2. Sierra Nevada
3. Cascades
4. Rockies
5. Grand Tetons
6. Black Hills
7. Appalachians
8. Adirondacks
9. Andes
10. Alps
11. Urals
12. Caucasus
13. Himalayas
14. Southern Alps or New Zealand

Summary

Mountains are landforms at least 600 meters above the surrounding land. Mountain features include the summit, slopes, and gorges. A series of mountains is a mountain range, and a group of ranges is a mountain system. Mountain formations change over time by weathering. Types of mountains include folded, fault-block, dissected, dome, and volcanic mountains.