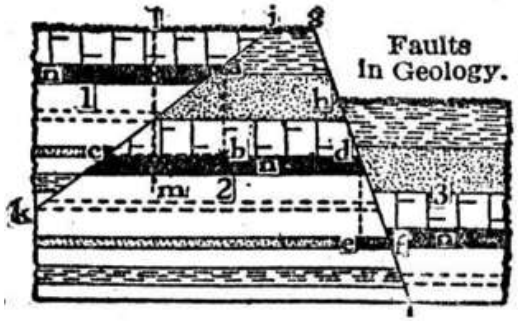
Name _____

Fault-Block Mountains and Valleys

By Patti Hutchison



A fault is a crack in a rock. We usually associate faults with earthquakes. But did you know that faults could also form mountains?

Mountains are formed by processes called orogeny. This process usually takes place near plate boundaries. Movements at these boundaries place stress and tension on the crustal rocks. They are deformed by folding and faulting. Mountains are classified by the way they are formed.

Tensions at plate boundaries often form faults in the earth's crust. There are different types of faults. Normal faults are caused by horizontal tension. Part of the crust is uplifted, and part of it moves downward. This happens at the line where the rock is broken, called the fault plane. In an area where there are many faults, mountain ranges can form. These mountains are called fault-block mountains.

Fault-block mountains often occur where plates are moving apart. The movement causes the rocks to be stretched. Temperatures are low and the rocks are brittle. Instead of folding, they break into large blocks.

Faulting causes some sections of the rock to be uplifted. These are called horsts. A horst is a part of the earth's crust that lies between two faults. It is higher than the surrounding land.

A horst is offset by a graben. This is a piece of land that has sunk between two faults. Scientists sometimes argue whether both horsts and grabens move, or if only one part moves. Many feel that the graben is the part that moves, due to the force of gravity. The horst is left standing higher above the sunken graben. This is difficult to determine.

Many fault-block mountain ranges are a horst and graben system. In these systems, the mountains (horsts) are separated by deep valleys (grabens). Sometimes the valleys are actually wide basins. The Teton Range in the Northwestern United States is an example of fault-block mountains.

These mountains have sharp peaks. This is because of the vertical movement and tilting of the rocks. Some of the mountains in this range rise over 12,000 feet. Most have a build up of debris at the base on the steepest side. This is because of erosion. The opposite sides have a more gradual slope.

Deep, wide valleys can form along fault lines, also. These are often called rift valleys. A rift is a place where pieces of crust are moving apart. This causes the land in between the faults to move downward.

Death Valley in California is an example of a rift valley. This long, narrow valley is 87 meters below sea level! Scientists believe that it will sink another three meters over the next thousand years.

Mountains are formed by slow movements of giant pieces of earth. Faulting is one of the processes of orogeny. Fault-block mountains are just one type of mountain that helps create the spectacular landscapes we have come to enjoy on earth.

Fault-Block Mountains and Valleys

Questions

1. What is orogeny?

_____

_____

_____

_____ 2. How are mountains classified?

A. by the kinds of rocks that make them up
B. by how high they are
C. by how they are formed

Name _____

3. Where do fault-block mountains occur?

_____

_____

_____

_____ 4. A block of land that lies between two faults and is higher than the surrounding land is called a:

A. valley
B. horst
C. graben

_____ 5. Many scientists believe that it is actually the graben that moves downward due to:

A. uplifting
B. gravity
C. atmospheric pressure

_____ 6. The land between two faults can move downward and form long, narrow valleys called:

A. fault-block mountains
B. rift valleys
C. escarpments

Explain what a horst and graben system is. Find and describe other mountain ranges that are examples of this kind of system.

_____

_____

_____

Name _____

Find more information about Death Valley. Write a paragraph about it.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____