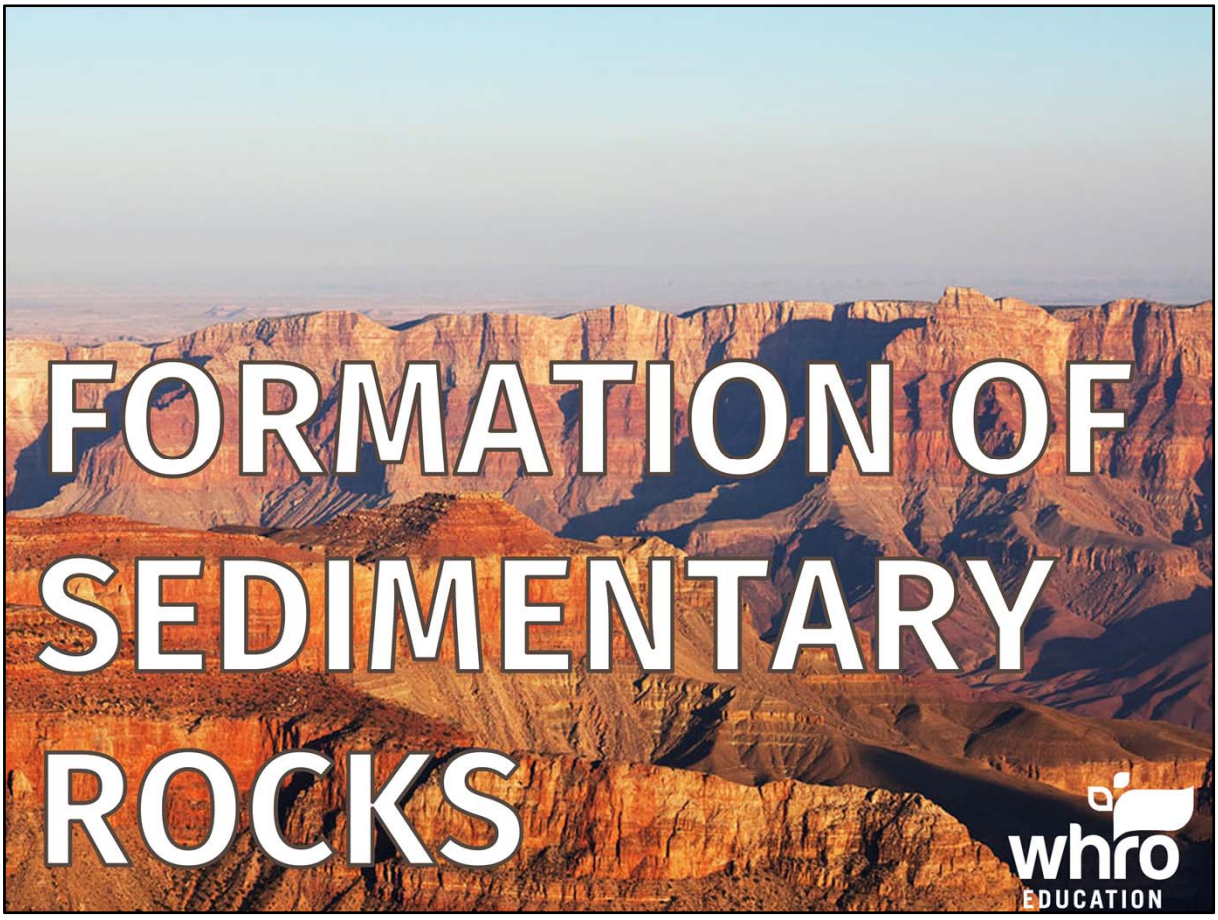
Module 6: Rocks

Topic 2 Content: Formation of Sedimentary Rocks Presentation Notes



Formation of Sedimentary Rocks

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Rocks at Earth's surface break down into smaller pieces as a result of weathering. A simple one word definition for weathering is breaking. Weathering occurs when rocks are exposed to the Sun, wind, and rain.

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There is no better place to view weathering than at a canyon. Over many years the river water will cut through the hard rock and carry away the smaller rock fragments. The end result is that the rocks will weather, or break, in the river water. The sediments produced by weathering are smaller and weigh less. Therefore, these sediments are easily moved. Shown here, you can see a location along the river that contains a deposit of sediment. Over time, the river water will transport this sediment downstream.

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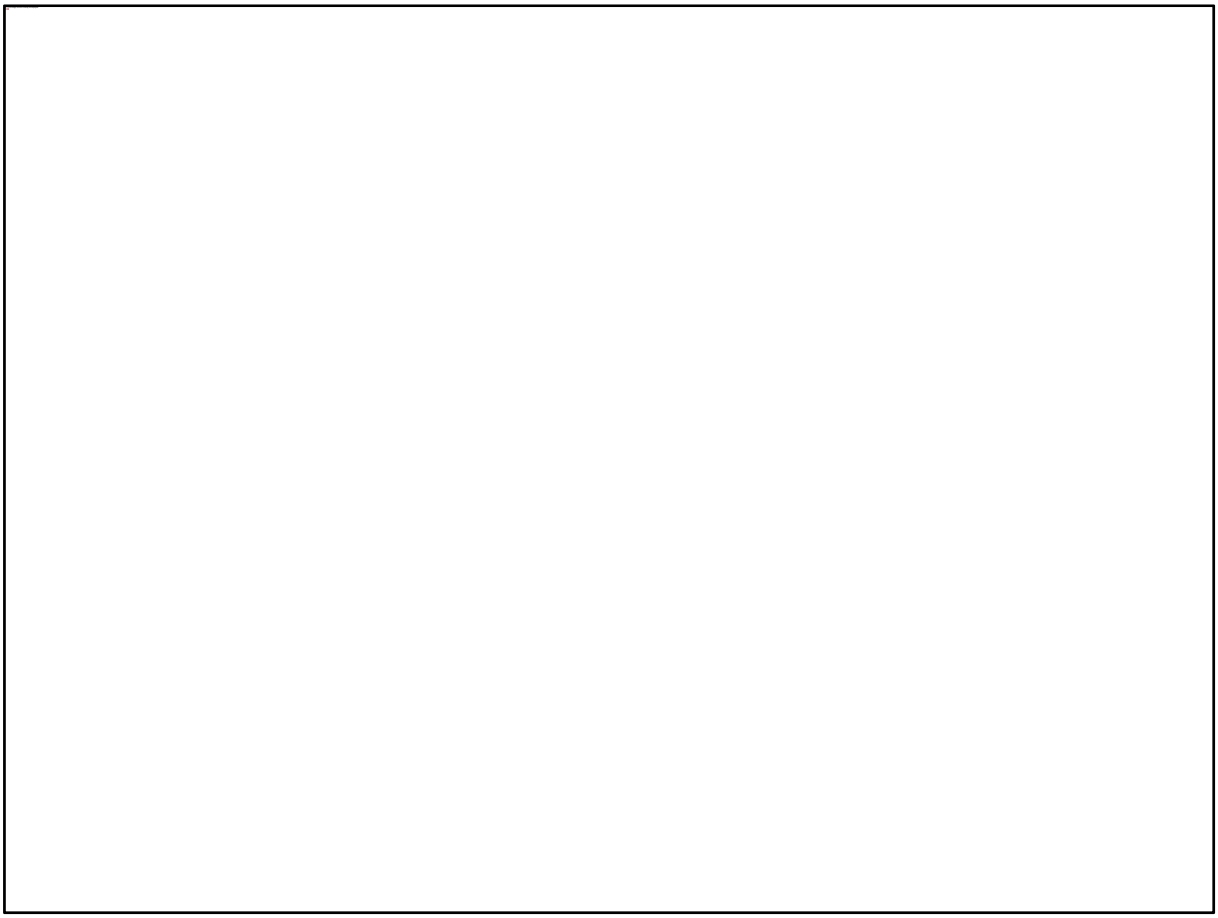

Forces of weathering include wind, water, glaciers, and gravity. Once broken, the process of erosion carries the sediments to a new location. Eventually, the sediments will stop moving. When the force of erosion stops, the sediments will drop and deposit onto the surface of Earth. The process where sediments drop as a result of erosion is called deposition. These sediments have not formed into a sedimentary rock yet. However, as more and more sediments are deposited, the conditions will eventually exist to create a rock.

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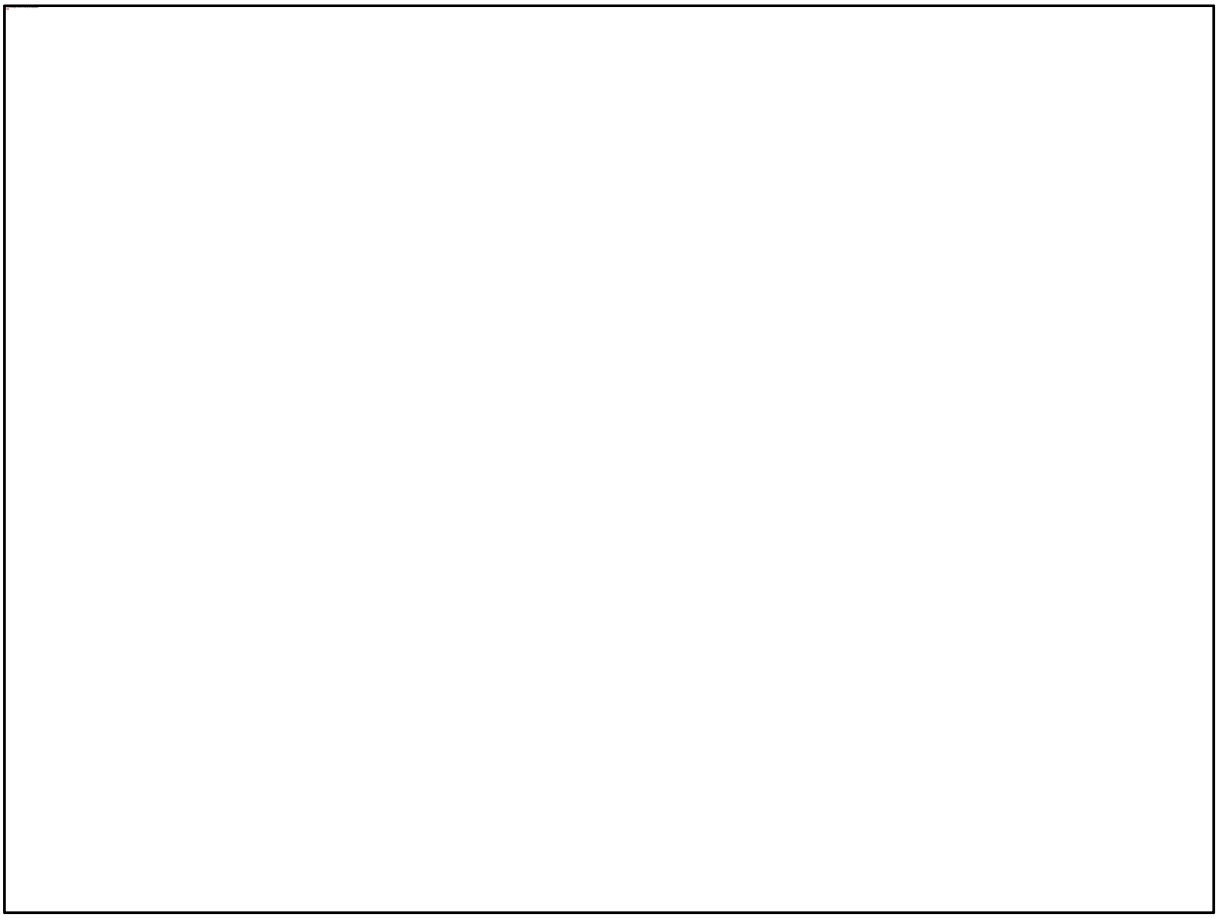

The image shows the Landmannalaugar Highlands of Iceland. During the winter months, glaciers dominate this area. These glaciers weather the surrounding mountainous rock. As winter changes to spring, the glaciers retreat. The sediments are deposited into a huge pile. This pile is termed an alluvial fan. As the process occurs year after year, the sediment pile will get quite large and very heavy.

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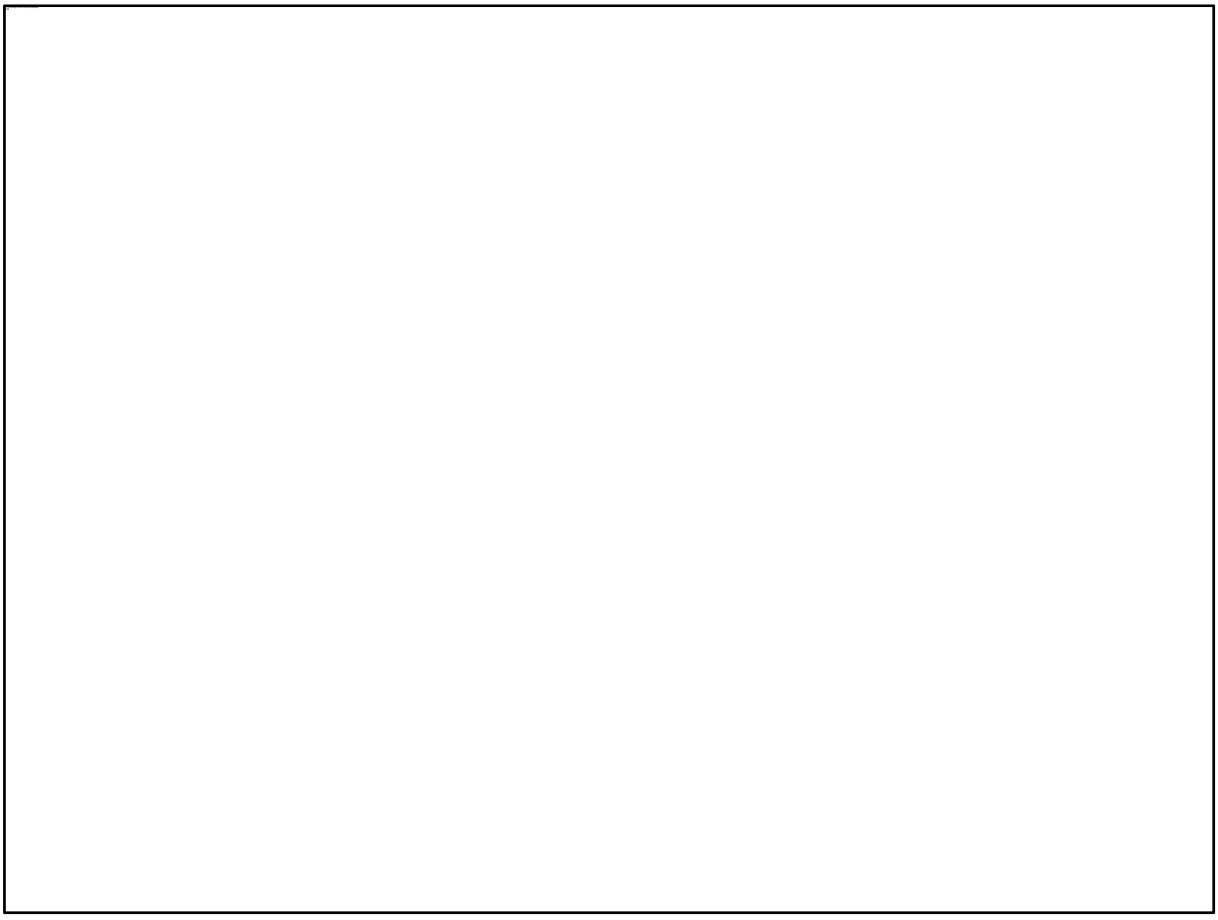

Over time, with plenty of deposition, sediments can become buried. The weight of the overlying sediments causes the sediments deeper beneath the surface to squeeze together in a process called compaction. The end result is layered sedimentary rocks. Again, the best place to witness the layering of Earth's surface is observing the walls of a deep canyon. In a canyon, the oldest sedimentary rock layers are found near the bottom of the canyon. The youngest layers are found near the top of the canyon.

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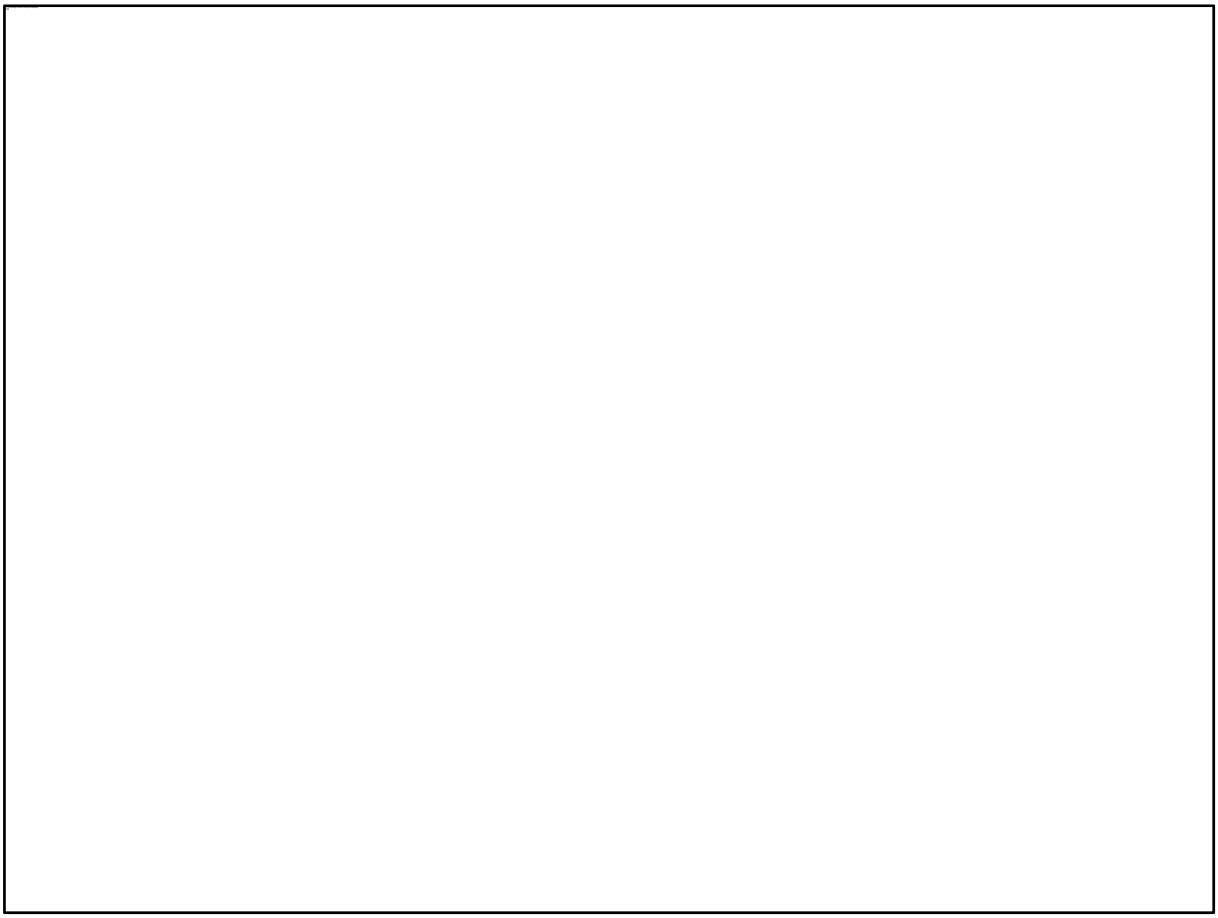

Deposition and compaction can also occur underwater. This process happens in rivers, lakes, and the ocean floor. Whether the process occurs in the sea or on the land, the sediments eventually pile on top of each other. Over time, the weight of the sediments squeezes them together by the process of compaction. The pressure becomes so great that the sediments glue together forming a new layer of sedimentary rock. You can see what the layers of compacted sedimentary rock look like in the canyon shown.

During the compaction process, water exists between the sediment particles. This water is forced outward by pressure. The water leaves behind the dissolved minerals it contained. The minerals act as a glue and the sediments bond together. This helps build the sediments into a solid mass of sedimentary rock.